SPEC® CFP2006 Result

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IBM Corporation

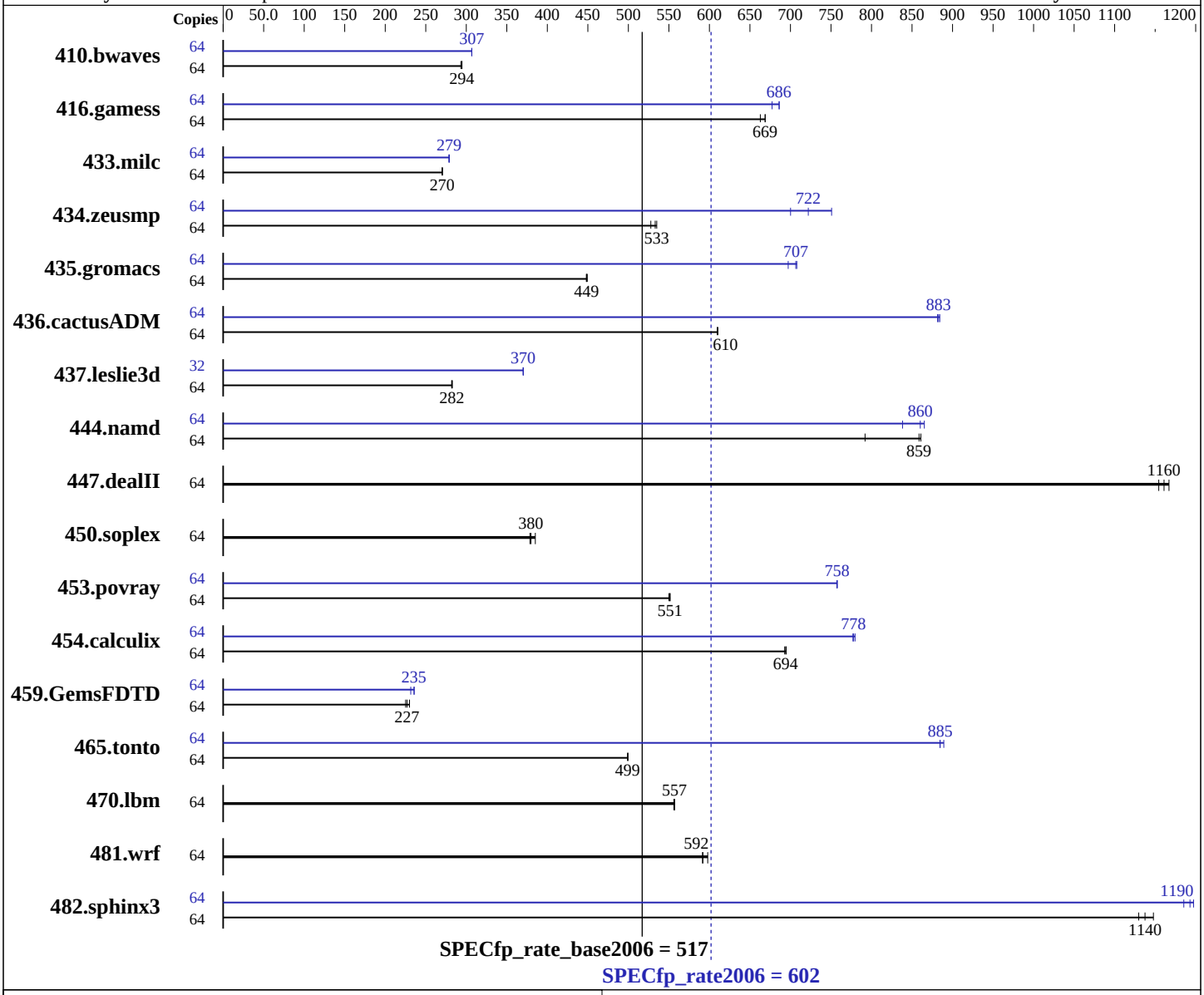
IBM Power 570 (4.2 GHz, 32 core)

SPECfp®_rate2006 = 602

SPECfp_rate_base2006 = 517

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

Test date: Sep-2008
Hardware Availability: Nov-2008
Software Availability: Nov-2008



Hardware

CPU Name:	POWER6+
CPU Characteristics:	
CPU MHz:	4200
FPU:	Integrated
CPU(s) enabled:	32 cores, 16 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	4,8,16,24,32 cores
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per core

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Software

Operating System:	IBM AIX V6.1 with the 6100-02 Technology Level
Compiler:	IBM XL C/C++ V10.1 for AIX IBM XL Fortran V12.1 for AIX
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user
Base Pointers:	32-bit

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L3 Cache: 32 MB I+D off chip per chip
Other Cache: None
Memory: 128 GB (64x2 GB) DDR2 667 MHz
Disk Subsystem: 4x73 GB 4x146 GB SAS 15K RPM
Other Hardware: None

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	64	**2954**	**294**	2952	295	2965	293	64	2835	307	**2835**	**307**	2835	307
416.gamess	64	**1874**	**669**	1874	669	1891	663	64	**1827**	**686**	1826	686	1850	677
433.milc	64	2174	270	**2173**	**270**	2172	270	64	**2107**	**279**	2108	279	2106	279
434.zeusmp	64	1089	535	1104	528	**1093**	**533**	64	832	700	776	751	**807**	**722**
435.gromacs	64	**1019**	**449**	1017	449	1020	448	64	**647**	**707**	646	708	655	697
436.cactusADM	64	1254	610	**1254**	**610**	1253	610	64	865	884	868	882	**866**	**883**
437.leslie3d	64	2127	283	2134	282	**2132**	**282**	32	813	370	**812**	**370**	812	370
444.namd	64	648	792	596	861	**598**	**859**	64	593	865	**597**	**860**	612	838
447.dealII	64	627	1170	634	1150	**631**	**1160**	64	627	1170	634	1150	**631**	**1160**
450.soplex	64	1386	385	**1405**	**380**	1410	379	64	1386	385	**1405**	**380**	1410	379
453.povray	64	**618**	**551**	619	550	617	551	64	**449**	**758**	449	758	450	757
454.calculix	64	762	693	760	695	**761**	**694**	64	679	777	677	780	**679**	**778**
459.GemsFDTD	64	2953	230	3016	225	**2993**	**227**	64	**2884**	**235**	2933	231	2880	236
465.tonto	64	1262	499	1261	499	**1261**	**499**	64	**712**	**885**	712	884	708	889
470.lbm	64	**1579**	**557**	1581	556	1578	557	64	**1579**	**557**	1581	556	1578	557
481.wrf	64	**1208**	**592**	1196	598	1209	591	64	**1208**	**592**	1196	598	1209	591
482.sphinx3	64	1104	1130	1087	1150	**1097**	**1140**	64	**1046**	**1190**	1052	1190	1042	1200

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 -bf -bp -ece -lap -las -nop -nopr -pto -RC -RD -rmte -so -tlo -A 64
               -lu 6 -rt 0.10 -ihf 60 -sdpla 32 -sdpms 32 -shci 10 -si -siht 15 -lun 32
fdpr binary optimization tool used for 433.milc 435.gromacs 437.leslie3d 453.povray
                                       454.calculix 482.sphinx3
  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 459.GemsFDTD
  with options -bf -bp -ece -hr -lap -nop -pca -RC -rmte -si -tb -tlo -vro -A 32 -rt 0.80
               -hrf 0.05 -sdp 5 -sdpms 512 -shci 90 -lun 27 -rcctf 0.70 -rccrf 0.80 -rcaf 2
```

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.
6400 16M large pages defined with vmo command
```

Platform Notes

```
System set to "Enhanced" mode when defining partition on HMC.
```

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`

Continued on next page

Base Portability Flags (Continued)

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`

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

470.lbm: basepeak = yes

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: basepeak = yes

450.soplex: basepeak = yes

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

Fortran benchmarks:

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

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Peak Optimization Flags (Continued)

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: -O4 -qlargepage -q64 -qfdpr -blpdata

465.tonto: -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O5 -bdatapsize:64K -bstackpsize:64K -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 -qlargepage -qenablevmx -qvecnvol -D_ILS_MACROS -qfdpr -qnostrict -blpdata

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

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-AIX.html
http://www.spec.org/cpu2006/flags/IBM-XL.20090713.html

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You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/IBM-AIX.xml
http://www.spec.org/cpu2006/flags/IBM-XL.20090713.xml

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