SPEC® CFP2006 Result

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IBM Corporation

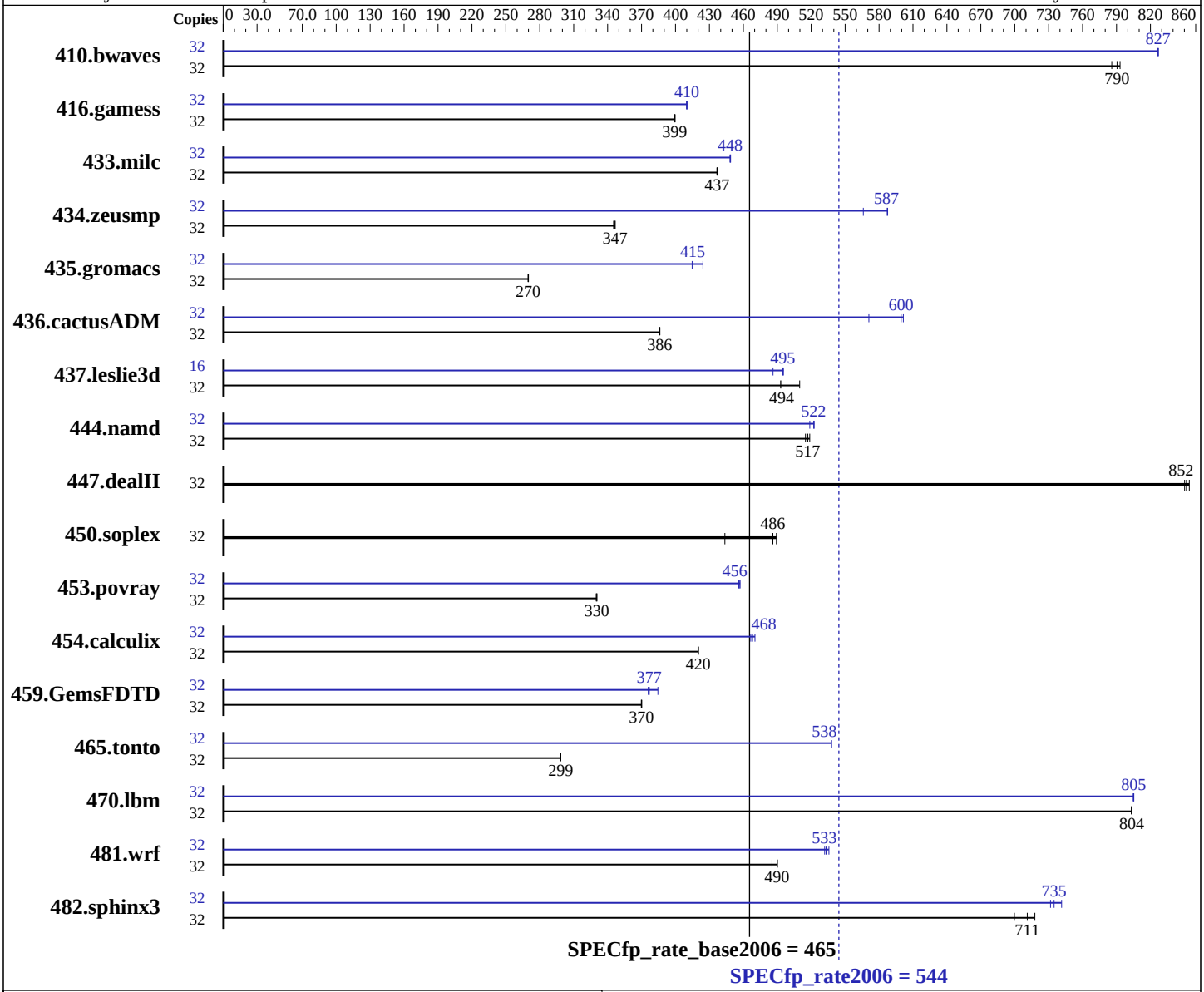
IBM Power 570 (5.0 GHz, 16 core)

SPECfp®_rate2006 = 544

SPECfp_rate_base2006 = 465

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:	5000
FPU:	Integrated
CPU(s) enabled:	16 cores, 8 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	2,4,8,12,16 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	32	553	786	548	793	**550**	**790**	32	526	827	526	827	**526**	**827**
416.gamess	32	1568	400	**1569**	**399**	1569	399	32	1528	410	**1528**	**410**	1529	410
433.milc	32	672	437	673	437	**672**	**437**	32	**655**	**448**	655	449	655	448
434.zeusmp	32	840	347	843	345	**840**	**347**	32	514	566	**496**	**587**	496	588
435.gromacs	32	846	270	**847**	**270**	847	270	32	**550**	**415**	539	424	551	415
436.cactusADM	32	991	386	990	386	**990**	**386**	32	670	571	**638**	**600**	636	601
437.leslie3d	32	590	510	610	493	**609**	**494**	16	**304**	**495**	309	486	304	495
444.namd	32	495	519	**496**	**517**	498	515	32	491	523	495	519	**491**	**522**
447.dealII	32	**430**	**852**	428	854	431	850	32	**430**	**852**	428	854	431	850
450.soplex	32	602	444	545	489	**549**	**486**	32	602	444	545	489	**549**	**486**
453.povray	32	515	330	516	330	**515**	**330**	32	372	457	**373**	**456**	373	456
454.calculix	32	628	420	**628**	**420**	629	420	32	566	467	**564**	**468**	561	470
459.GemsFDTD	32	917	370	918	370	**918**	**370**	32	903	376	883	384	**901**	**377**
465.tonto	32	1056	298	1055	299	**1055**	**299**	32	586	538	585	538	**585**	**538**
470.lbm	32	547	803	547	804	**547**	**804**	32	**546**	**805**	547	804	546	805
481.wrf	32	729	490	**730**	**490**	736	485	32	672	532	**670**	**533**	667	536
482.sphinx3	32	891	700	**877**	**711**	869	718	32	**849**	**735**	841	741	852	732

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 481.wrf 482.sphinx3
  with options -O4 -vrox -pbsi
fdpr binary optimization tool used for 434.zeusmp 470.lbm
  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.
3200 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: -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: basepeak = yes

450.soplex: basepeak = yes

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

Fortran benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

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: -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 -qenablevmx -qvecnvol -D_ILS_MACROS -qfdpr -qnostrict -bdatapsize:64K -bstackpsize:64K -btextpsize:64K

454.calculix: -O4 -qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

481.wrf: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage -q64 -D_ILS_MACROS -qfdpr -blpdata

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

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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