SPEC® CFP2006 Result

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IBM Corporation

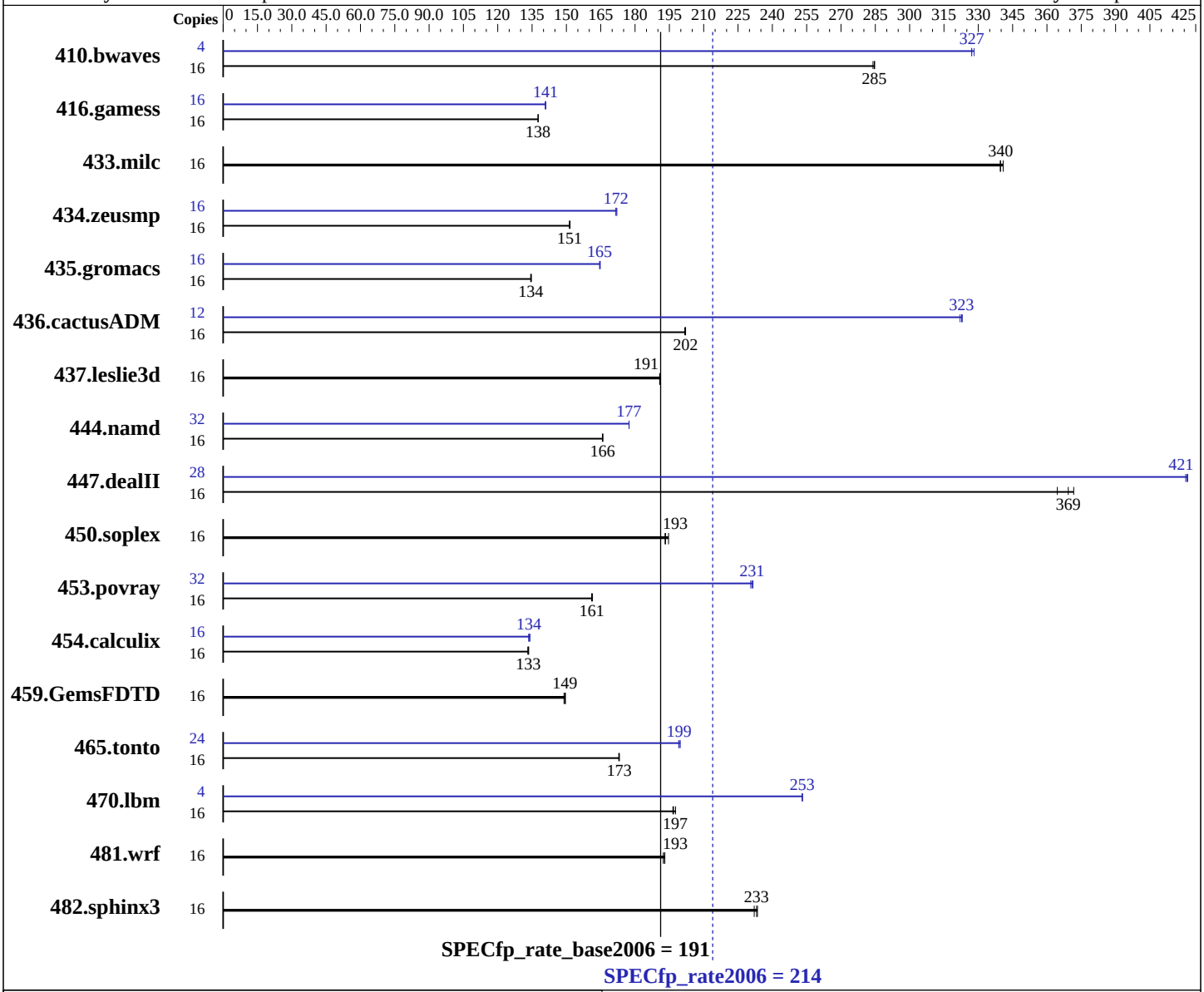
IBM Power S814 (3.026 GHz, 4 core)

SPECfp®_rate2006 = 214

SPECfp_rate_base2006 = 191

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

Test date: May-2015
Hardware Availability: Jun-2014
Software Availability: Sep-2014



Hardware

CPU Name:	POWER8
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.36 GHz
CPU MHz:	3026
FPU:	Integrated
CPU(s) enabled:	4 cores, 2 chips, 2 cores/chip, 8 threads/core
CPU(s) orderable:	1 Modules
Primary Cache:	32 KB I + 64 KB D on chip per core

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Software

Operating System:	IBM AIX V7.1
Compiler:	C/C++: Version 13.1 of IBM XL C/C++ for AIX Fortran: Version 15.1 of IBM XL Fortran for AIX
Auto Parallel:	No
File System:	AIX/JFS2
System State:	Multi-user
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	None

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Secondary Cache: 512 KB I+D on chip per core
L3 Cache: 8 MB I+D on chip per core
Other Cache: 16 MB I+D off chip per CDIMM
Memory: 64 GB (4 x 16 GB CDIMMs) DDR3 1600 MHz
Disk Subsystem: 5 x 300 GB 15K RPM SAS SFF-2 Raid0
Other Hardware: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	764	285	766	284	**764**	**285**	4	166	328	166	327	**166**	**327**
416.gamess	16	2275	138	**2276**	**138**	2276	138	16	2221	141	**2223**	**141**	2226	141
433.milc	16	431	341	**432**	**340**	432	340	16	431	341	**432**	**340**	432	340
434.zeusmp	16	962	151	**962**	**151**	960	152	16	848	172	846	172	**848**	**172**
435.gromacs	16	850	134	848	135	**850**	**134**	16	694	165	693	165	**694**	**165**
436.cactusADM	16	**946**	**202**	946	202	948	202	12	444	323	**444**	**323**	445	322
437.leslie3d	16	**788**	**191**	788	191	788	191	16	**788**	**191**	788	191	788	191
444.namd	16	774	166	773	166	**774**	**166**	32	**1447**	**177**	1447	177	1447	177
447.dealII	16	502	365	**496**	**369**	492	372	28	762	421	**761**	**421**	760	422
450.soplex	16	691	193	686	195	**690**	**193**	16	691	193	686	195	**690**	**193**
453.povray	16	529	161	**528**	**161**	527	161	32	**737**	**231**	738	231	735	232
454.calculix	16	992	133	989	134	**989**	**133**	16	989	134	984	134	**988**	**134**
459.GemsFDTD	16	1140	149	1135	150	**1136**	**149**	16	1140	149	1135	150	**1136**	**149**
465.tonto	16	911	173	910	173	**910**	**173**	24	**1185**	**199**	1182	200	1186	199
470.lbm	16	1119	197	**1117**	**197**	1112	198	4	**217**	**253**	217	253	217	253
481.wrf	16	929	192	926	193	**927**	**193**	16	929	192	926	193	**927**	**193**
482.sphinx3	16	1344	232	1335	234	**1338**	**233**	16	1344	232	1335	234	**1338**	**233**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Invocation Notes

```
C/C++ compiler updated to September 2014 PTF
      Version 13.01.0000.0001
Fortran compiler updated to September 2014 PTF
      Version 15.01.0000.0001
```

Peak Tuning Notes

```
410.bwaves fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
416.gamess fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
433.milc fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
434.zeusmp fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
435.gromacs fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
436.cactusADM fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
```

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Peak Tuning Notes (Continued)

```
437.leslie3d fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
444.namd fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
447.dealII fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
453.povray fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
454.calculix fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
459.GemsFDTD fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
465.tonto fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
470.lbm fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
481.wrf fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
482.sphinx3 fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -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

```
AIX updated to V7.1 TL3 SP4

All ulimits set to unlimited.
Set 8 threads per core via "smtctl -t 8 -w boot"

3200 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:
```
/opt/IBM/xlc/13.1.0/bin/xlc -qlanglvl=extc99
```

C++ benchmarks:
```
/opt/IBM/xlC/13.1.0/bin/xlC
```

Fortran benchmarks:
```
/opt/IBM/xlf/15.1.0/bin/xlf95
```

Benchmarks using both Fortran and C:
```
/opt/IBM/xlc/13.1.0/bin/xlc -qlanglvl=extc99
/opt/IBM/xlf/15.1.0/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:
`-qinline=40 -qipa=threads -bmaxdata:0x40000000 -qlargepage -O5 -qsimd=noauto -D_ILS_MACROS -blpdata`

C++ benchmarks:
`-qinline=40 -qipa=threads -bmaxdata:0x50000000 -qlargepage -O5 -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 -qvecnvol -qsmallstack=dynlenonheap -qalias=nostd -blpdata`

Benchmarks using both Fortran and C:
`-qinline=40 -qipa=threads -bmaxdata:0x60000000 -qlargepage -O5 -qsimd=noauto -D_ILS_MACROS -qvecnvol -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:
/opt/IBM/xlc/13.1.0/bin/xlc -qlanglvl=extc99

C++ benchmarks:
/opt/IBM/xlC/13.1.0/bin/xlC

Fortran benchmarks:
/opt/IBM/xlf/15.1.0/bin/xlf95

Benchmarks using both Fortran and C:
/opt/IBM/xlc/13.1.0/bin/xlc -qlanglvl=extc99
/opt/IBM/xlf/15.1.0/bin/xlf95

Peak Portability Flags

410.bwaves: -qfixed
416.gamess: -qfixed
434.zeusmp: -qfixed
435.gromacs: -qfixed -qextname
436.cactusADM: -DSPEC_CPU_LP64 -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: basepeak = yes

470.lbm: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O5 -qsimd=noauto -qprefetch=dscr=84
-D_ILS_MACROS -qfdpr -q64 -blpdata -btextpsize:64K

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -qinline=40 -qipa=threads -qlargepage -O4 -qvecnvol
-qfdpr -D_ILS_MACROS -D__IBM_FAST_VECTOR
-D__IBM_FAST_SET_MAP_ITERATOR -blpdata -btextpsize:64K

447.dealII: -qinline=40 -qipa=threads -bmaxdata:0x50000000
-qpdf1(pass 1) -qpdf2(pass 2) -qlargepage -O4 -qvecnvol
-qfdpr -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: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O3 -qarch=auto -qtune=auto
-qprefetch=dscr=147 -D_ILS_MACROS -qalign=natural -qfdpr
-blpdata -btextpsize:64K

Fortran benchmarks:

410.bwaves: -qipa=threads -bmaxdata:0x50000000 -qlargepage -O5
-qsimd=noauto -qprefetch=dscr=84 -qfdpr
-qsmallstack=dynlenonheap -blpdata -btextpsize:64K

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qlargepage -O5
-qsimd=noauto -qalias=nostd -qfdpr -blpdata
-btextpsize:64K

434.zeusmp: -qipa=threads -qlargepage -O4 -qsimd=noauto
-qxlf90=nosignedzero -qfdpr -q64 -blpdata -btextpsize:64K

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

465.tonto: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -qlargepage
-O5 -qvecnvol -qprefetch=dscr=147 -qfdpr -q64 -blpdata
-btextpsize:64K

Benchmarks using both Fortran and C:

435.gromacs: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O4 -qvecnvol -D_ILS_MACROS -qfdpr -blpdata
-btextpsize:64K

436.cactusADM: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O4 -qvecnvol -qarch=pwr7 -qtune=pwr7 -q64
-D_ILS_MACROS -qfdpr -blpdata -btextpsize:64K

454.calculix: -qinline=40 -qipa=threads -O5 -qsimd=noauto
-qprefetch=dscr=147 -D_ILS_MACROS -qfdpr -blpdata
-btextpsize:64K

481.wrf: basepeak = yes

Peak 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 (except as noted below):
```
-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036
```

454.calculix: `-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.V13.html
http://www.spec.org/cpu2006/flags/IBM-AIX.V7.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-XL.V13.xml
http://www.spec.org/cpu2006/flags/IBM-AIX.V7.xml

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