



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 1370

## IBM Power S824 (3.5 GHz, 24 core)

### SPECfp\_rate\_base2006 = 1180

CPU2006 license: 11

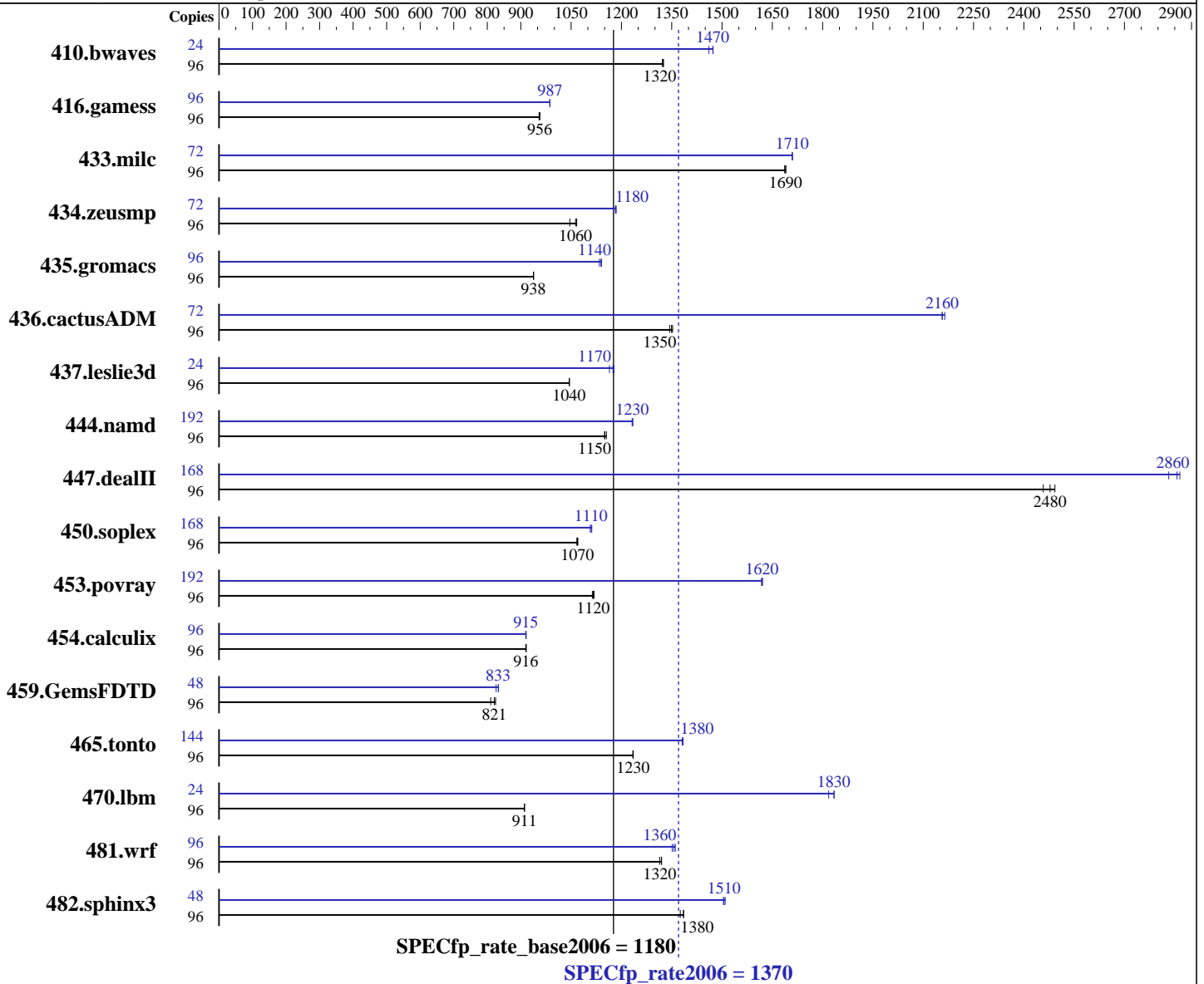
Test date: Apr-2014

Test sponsor: IBM Corporation

Hardware Availability: Jun-2014

Tested by: IBM Corporation

Software Availability: Jun-2014



### Hardware

CPU Name: POWER8  
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.92 GHz  
 CPU MHz: 3525  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip, 8 threads/core  
 CPU(s) orderable: 2 Modules  
 Primary Cache: 32 KB I + 64 KB D on chip per core

### 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: 512 GB (16 x 32 GB CDIMMs) DDR3 1600 MHz  
Disk Subsystem: 5 x 300 GB 15K RPM SAS SF-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	96	987	1320	985	1330	<b><u>985</u></b>	<b><u>1320</u></b>	24	221	1470	223	1460	<b><u>221</u></b>	<b><u>1470</u></b>
416.gamess	96	1965	957	1970	954	<b><u>1965</u></b>	<b><u>956</u></b>	96	1905	987	<b><u>1905</u></b>	<b><u>987</u></b>	1905	987
433.milc	96	521	1690	522	1690	<b><u>522</u></b>	<b><u>1690</u></b>	72	<b><u>387</u></b>	<b><u>1710</u></b>	387	1710	386	1710
434.zeusmp	96	835	1050	<b><u>822</u></b>	<b><u>1060</u></b>	819	1070	72	<b><u>554</u></b>	<b><u>1180</u></b>	554	1180	553	1180
435.gromacs	96	731	937	<b><u>731</u></b>	<b><u>938</u></b>	731	938	96	601	1140	604	1130	<b><u>602</u></b>	<b><u>1140</u></b>
436.cactusADM	96	<b><u>850</u></b>	<b><u>1350</u></b>	848	1350	854	1340	72	399	2160	398	2160	<b><u>399</u></b>	<b><u>2160</u></b>
437.leslie3d	96	864	1040	<b><u>864</u></b>	<b><u>1040</u></b>	863	1050	24	194	1160	192	1180	<b><u>192</u></b>	<b><u>1170</u></b>
444.namd	96	670	1150	<b><u>669</u></b>	<b><u>1150</u></b>	666	1160	192	1248	1230	<b><u>1250</u></b>	<b><u>1230</u></b>	1250	1230
447.dealII	96	447	2460	441	2490	<b><u>443</u></b>	<b><u>2480</u></b>	168	679	2830	671	2870	<b><u>673</u></b>	<b><u>2860</u></b>
450.soplex	96	748	1070	<b><u>749</u></b>	<b><u>1070</u></b>	750	1070	168	1260	1110	<b><u>1263</u></b>	<b><u>1110</u></b>	1266	1110
453.povray	96	457	1120	<b><u>457</u></b>	<b><u>1120</u></b>	459	1110	192	<b><u>631</u></b>	<b><u>1620</u></b>	631	1620	630	1620
454.calculix	96	<b><u>865</u></b>	<b><u>916</u></b>	864	916	866	915	96	<b><u>866</u></b>	<b><u>915</u></b>	865	916	866	915
459.GemsFDTD	96	1257	810	1235	825	<b><u>1241</u></b>	<b><u>821</u></b>	48	611	834	616	826	<b><u>612</u></b>	<b><u>833</u></b>
465.tonto	96	765	1230	<b><u>765</u></b>	<b><u>1230</u></b>	765	1240	144	<b><u>1024</u></b>	<b><u>1380</u></b>	1026	1380	1024	1380
470.lbm	96	<b><u>1448</u></b>	<b><u>911</u></b>	1448	911	1448	911	24	180	1830	181	1820	<b><u>180</u></b>	<b><u>1830</u></b>
481.wrf	96	<b><u>813</u></b>	<b><u>1320</u></b>	813	1320	816	1310	96	793	1350	788	1360	<b><u>791</u></b>	<b><u>1360</u></b>
482.sphinx3	96	<b><u>1351</u></b>	<b><u>1380</u></b>	1350	1390	1360	1380	48	<b><u>621</u></b>	<b><u>1510</u></b>	620	1510	622	1500

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

## 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
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

```

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Test date: Apr-2014

Hardware Availability: Jun-2014

Software Availability: Jun-2014

## Peak Tuning Notes (Continued)

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 SP3

All ulimits set to unlimited.

Set 8 threads per core via "smtctl -t 8 -w boot"

19200 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 = "intrinths=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

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## Base Portability Flags (Continued)

```

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
-qvecnvml -D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR
-D__IBM_FAST_SET_MAP_ITERATOR -blpdata

```

Fortran benchmarks:

```

-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5 -qvecnvml
-qsmallstack=dynlenonheap -qalias=nostd -blpdata

```

Benchmarks using both Fortran and C:

```

-qinline=40 -qipa=threads -bmaxdata:0x60000000 -qlargepage -O5
-qsimd=noauto -D_ILS_MACROS -qvecnvml -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

```



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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: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)  
-qlargepage -O5 -qvecnvols -qprefetch=dscr=147  
-D\_ILS\_MACROS -qalign=natural -qfdpr -q64 -blpdata  
-btextpsize:64K

470.lbm: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)  
-qlargepage -O5 -qsimd=noauto -D\_ILS\_MACROS -qfdpr -q64  
-blpdata -btextpsize:64K

482.sphinx3: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)  
-qlargepage -O5 -qsimd=noauto -D\_ILS\_MACROS -qfdpr  
-blpdata -btextpsize:64K

C++ benchmarks:

444.namd: -qinline=40 -qipa=threads -qlargepage -O4 -qvecnvols  
-qfdpr -D\_ILS\_MACROS -D\_\_IBM\_FAST\_VECTOR  
-D\_\_IBM\_FAST\_SET\_MAP\_ITERATOR -blpdata -btextpsize:64K

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## Peak Optimization Flags (Continued)

447.deallI: -qinline=40 -qipa=threads -bmaxdata:0x50000000  
-qpdf1(pass 1) -qpdf2(pass 2) -qlargepage -O4 -qvecnvoll  
-qfdpr -D\_ILS\_MACROS -qrtti=all -D\_\_IBM\_FAST\_VECTOR  
-D\_\_IBM\_FAST\_SET\_MAP\_ITERATOR -blpdata -btextpsize:64K

450.soplex: -qinline=40 -qipa=threads -bmaxdata:0x40000000  
-qpdf1(pass 1) -qpdf2(pass 2) -qlargepage -O3 -qarch=auto  
-qtune=auto -qsimd -qvecnvoll -qprefetch=dscr=147  
-D\_ILS\_MACROS -D\_\_IBM\_FAST\_VECTOR  
-D\_\_IBM\_FAST\_SET\_MAP\_ITERATOR -blpdata -btextpsize:64K

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 -qfdpr -qsmallstack=dynlenonheap -blpdata  
-btextpsize:64K

416.gamess: -qipa=threads -bmaxdata:0x40000000 -qlargepage -O5  
-qsimd=noauto -qprefetch=dscr=84 -qalias=nostd -qfdpr  
-blpdata -btextpsize:64K

434.zeusmp: -qipa=threads -qlargepage -O4 -qsimd=noauto  
-qxl90=nosignedzero -qfdpr -q64 -blpdata -btextpsize:64K

437.leslie3d: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -qlargepage  
-O5 -qvecnvoll -q64 -qfdpr -blpdata -btextpsize:64K

459.GemsFDTD: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -qlargepage  
-O5 -qvecnvoll -qfdpr -q64 -blpdata -btextpsize:64K

465.tonto: Same as 459.GemsFDTD

### Benchmarks using both Fortran and C:

435.gromacs: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)  
-qlargepage -O4 -qvecnvoll -D\_ILS\_MACROS -qfdpr -blpdata  
-btextpsize:64K

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

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## Peak Optimization Flags (Continued)

454.calculix: -qinline=40 -qipa=threads -O5 -qsimd=noauto -D\_ILS\_MACROS  
-qfdpr -blpdata -btextpsize:64K

481.wrf: -qinline=40 -qipa=threads -bmaxdata:0x30000000 -qlargepage  
-O5 -qvecnvml -D\_ILS\_MACROS -qfdpr -blpdata  
-btextpsize:64K

## 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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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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