



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]_rate2006 = **575**

IBM PowerLinux 7R2 (4.2 GHz, 16 core, SLES)

SPECfp_rate_base2006 = **509**

CPU2006 license: 11

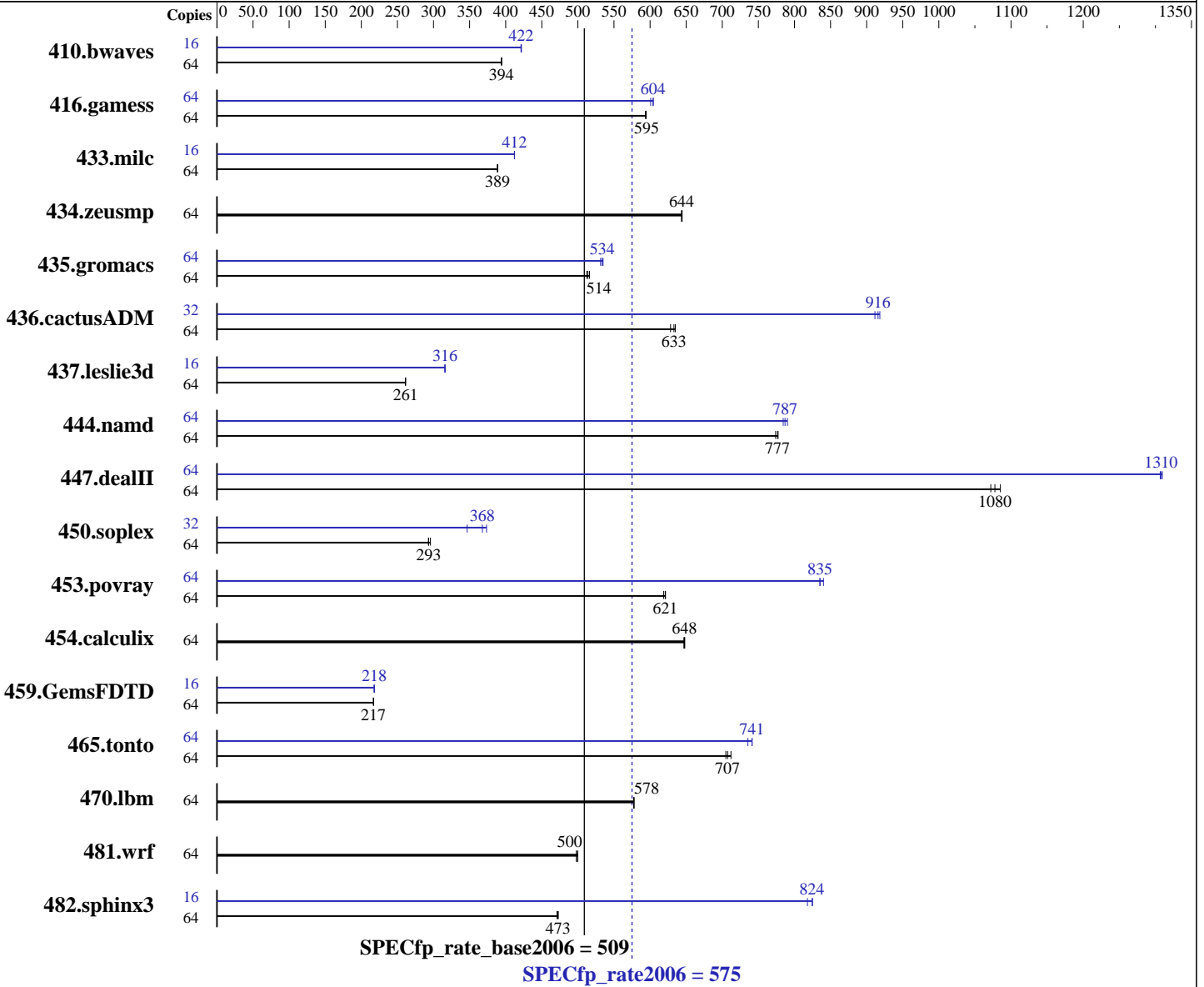
Test date: Jan-2013

Test sponsor: IBM Corporation

Hardware Availability: Feb-2013

Tested by: IBM Corporation

Software Availability: Dec-2012



Hardware

CPU Name: POWER7+
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 4.540 GHz
 CPU MHz: 4228
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 4 threads/core
 CPU(s) orderable: 16 cores
 Primary Cache: 32 KB I + 32 KB D on chip per core

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Software

Operating System: SUSE Linux Enterprise Server 11 SP2 (ppc64) kernel 3.0.42-0.7-ppc64
 Compiler: C/C++: Version 12.1 of IBM XL C/C++ for Linux; Fortran: Version 14.1 of IBM XL Fortran for Linux
 Auto Parallel: No
 File System: ext3
 System State: Run level 3 (multi-user)
 Base Pointers: 32-bit
 Peak Pointers: 32/64-bit

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Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 10 MB I+D on chip per core
 Other Cache: None
 Memory: 128 GB (16 x 8 GB) DDR3 1066 MHz
 Disk Subsystem: 1 x 146.8 GB SAS SFF 15K RPM
 Other Hardware: None

Other Software: -Post-Link Optimization for Linux on POWER, version 5.6.1-7
 -MicroQuill SmartHeap 9
 -Apache C++ Standard Library V4.2.1

Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	64	2209	394	2205	394	2207	394	16	516	422	516	422	516	421		
416.gamess	64	2107	595	2108	595	2112	593	64	2086	601	2073	605	2074	604		
433.milc	64	1511	389	1512	389	1511	389	16	356	412	356	412	356	412		
434.zeusmp	64	904	644	904	644	905	644	64	904	644	904	644	905	644		
435.gromacs	64	892	512	885	516	889	514	64	854	535	856	534	860	531		
436.cactusADM	64	1204	635	1208	633	1217	628	32	418	916	416	918	420	911		
437.leslie3d	64	2302	261	2305	261	2303	261	16	476	316	476	316	476	316		
444.namd	64	660	777	661	777	663	774	64	654	784	650	790	652	787		
447.dealII	64	679	1080	675	1090	683	1070	64	560	1310	560	1310	559	1310		
450.soplex	64	1821	293	1805	296	1821	293	32	770	347	726	368	715	373		
453.povray	64	550	619	548	621	548	621	64	408	835	405	840	408	835		
454.calculix	64	816	647	815	648	815	648	64	816	647	815	648	815	648		
459.GemsFDTD	64	3129	217	3132	217	3132	217	16	779	218	779	218	779	218		
465.tonto	64	884	712	893	705	890	707	64	849	741	856	735	850	741		
470.lbm	64	1522	578	1523	577	1522	578	64	1522	578	1523	577	1522	578		
481.wrf	64	1431	500	1436	498	1430	500	64	1431	500	1436	498	1430	500		
482.sphinx3	64	2648	471	2640	473	2639	473	16	381	818	378	825	378	824		

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 December 2012 PTF
 Version: 12.01.0000.0002
 Fortran compiler updated to December 2012 PTF
 Version: 14.01.0000.0002

Peak Tuning Notes

Post-Link optimization tool used for:
 433.milc 435.gromacs 450.soplex 482.sphinx3
 with options -O4 -nodp
 434.zeusmp
 with options -O4 -vrox -nodp
 437.leslie3d

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Peak Tuning Notes (Continued)

```
with options -O3 -lu -1 -nodp -sdp 9
444.namd
with options -O3 -lu -1 -nodp -sdp 9
450.soplex
with options -O4 -nodp
465.tonto
with options -O4
482.sphinx3
with options -O4 -nodp
```

Submit Notes

The config file option 'submit' was used to assign benchmark copy to specific kernel thread using the "numactl" command (see flags file for details).

Operating System Notes

ulimit -s (stack) set to 1048576.

Large pages reserved as follows by root user:
echo 4224 > /proc/sys/vm/nr_hugepages

The Apache C++ Standard Library V4.2.1 was installed from <http://stdcxx.apache.org/download.html> using:
gmake BUILDTYPE=8d CONFIG=gcc.config

The following environment variables were set before the runspec command:
export HUGETLB_VERBOSE=0
export HUGETLB_MORECORE=yes
export HUGETLB_ELFMAP=RW
export XLFRTEOPTS=intrinthds=1

Base Compiler Invocation

C benchmarks:

```
xlc -qlanglvl=extc99
```

C++ benchmarks:

```
xlC
```

Fortran benchmarks:

```
xlF95
```

Benchmarks using both Fortran and C:

```
xlc -qlanglvl=extc99 xlf95
```



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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: -DNOUNDERSCORE
482.sphinx3: -qchars=signed
```

Base Optimization Flags

C benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
```

C++ benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads -qrtti
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
```

Fortran benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads -qalias=nostd
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
```

Benchmarks using both Fortran and C:

```
-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align -qalias=nostd
```

Base Other Flags

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

Peak Compiler Invocation

C benchmarks:

```
xlc -qlanglvl=extc99
```

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Peak Compiler Invocation (Continued)

C++ benchmarks:
x1C

Fortran benchmarks:
x1f95

Benchmarks using both Fortran and C:
x1c -qlanglvl=extc99 x1f95

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
453.povray: -DSPEC_CPU_LP64
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: -Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads
-lhugetlbfs

470.lbm: basepeak = yes

482.sphinx3: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7
-qtune=pwr7 -qipa=threads -lhugetlbfs

C++ benchmarks:

444.namd: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7
-qtune=pwr7 -qipa=threads -lhugetlbfs

447.dealII: -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qrtti
-qcopp_stdinc=/opt/stdcxx421/include/ansi:/opt/stdcxx421/include:/opt/ibmcmp/vacpp/12.1/i
-lsmartheap -L/opt/stdcxx421/lib -R/opt/stdcxx421/lib
-lstd8d

450.soplex: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr7
-qtune=pwr7 -q64 -lhugetlbfs

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Peak Optimization Flags (Continued)

453.povray: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7
-qtune=pwr7 -qipa=threads -qsimd -q64 -lsmartheap64

Fortran benchmarks:

410.bwaves: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7 -qtune=pwr7
-qipa=threads -qsmallstack=dynlenonheap -q64 -lhugetlbfs

416.gamess: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7
-qipa=threads -qalias=nostd -lhugetlbfs

434.zeusmp: basepeak = yes

437.leslie3d: -Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -q64
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

459.GemsFDTD: -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsimd
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

465.tonto: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7
-qtune=pwr7 -qipa=threads -qsimd -lhugetlbfs

Benchmarks using both Fortran and C:

435.gromacs: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7
-qtune=pwr7 -qipa=threads -qsimd -lhugetlbfs

436.cactusADM: -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsimd
-qnostrict -q64 -lhugetlbfs

454.calculix: basepeak = yes

481.wrf: basepeak = yes

Peak Other Flags

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/IBM-Power.html>

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.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-Power.xml>

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.xml>

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