



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]_rate2006 = 422

IBM Power 730 Express (3.7 GHz, 12 core, RedHat)

SPECfp_rate_base2006 = 380

CPU2006 license: 11

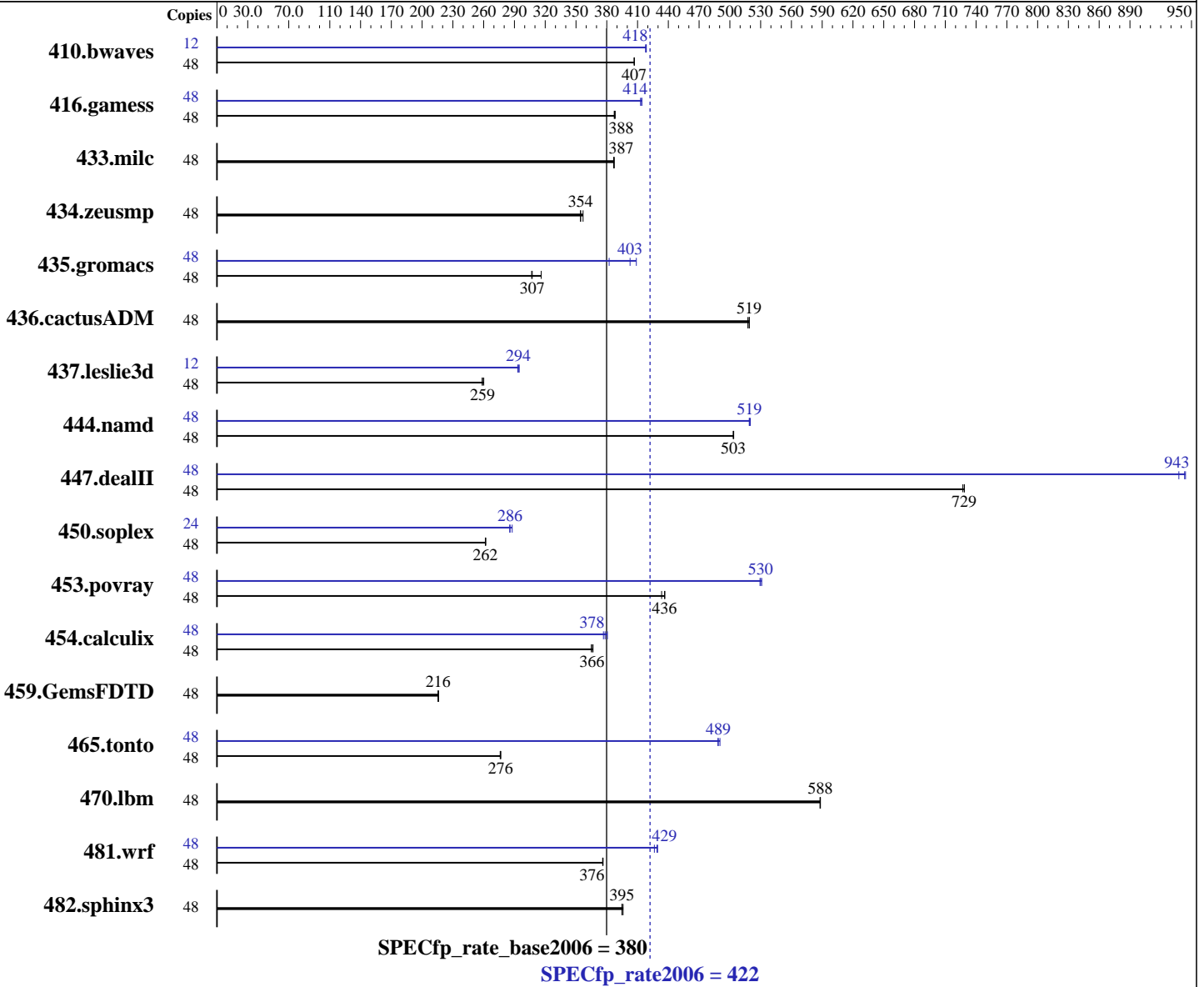
Test date: Jan-2011

Test sponsor: IBM Corporation

Hardware Availability: Sep-2010

Tested by: IBM Corporation

Software Availability: Nov-2010



Hardware

CPU Name: POWER7
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.92 GHz
 CPU MHz: 3724
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 4 threads/core
 CPU(s) orderable: 12 cores
 Primary Cache: 32 KB I + 32 KB D on chip per core

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 6.0 (ppc64), Kernel 2.6.32-71.el6.ppc64
 Compiler: IBM XL C/C++ for Linux, V11.1
 Version: 11.01.0000.0001
 IBM XL Fortran for Linux, V13.1
 Version: 13.01.0000.0001
 Auto Parallel: No
 File System: ext3
 System State: Run Level 3 (multi-user)

Continued on next page



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Secondary Cache: 256 KB I+D on chip per core
 L3 Cache: 4 MB I+D on chip per core
 Other Cache: None
 Memory: 128 GB (16 x 8 GB) DDR3 1066 MHz
 Disk Subsystem: 2 x 146.8 GB SAS SFF 15K RPM
 Other Hardware: None

Base Pointers: 32-bit
 Peak Pointers: 32/64-bit
 Other Software: -Post-Link Optimization for Linux on POWER, Version 5.6.0-2
 -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	48	1604	407	1604	407	1603	407	12	390	418	390	419	390	418
416.gamess	48	2425	388	2427	387	2421	388	48	2269	414	2276	413	2270	414
433.milc	48	1140	387	1138	387	1139	387	48	1140	387	1138	387	1139	387
434.zeusmp	48	1232	354	1232	354	1224	357	48	1232	354	1232	354	1224	357
435.gromacs	48	1084	316	1115	307	1117	307	48	838	409	896	382	851	403
436.cactusADM	48	1105	519	1108	518	1105	519	48	1105	519	1108	518	1105	519
437.leslie3d	48	1745	259	1743	259	1735	260	12	384	294	383	295	385	293
444.namd	48	765	503	764	504	765	503	48	742	519	741	519	740	520
447.dealII	48	754	729	755	727	754	729	48	582	944	586	938	582	943
450.soplex	48	1527	262	1530	262	1530	262	24	701	285	695	288	701	286
453.povray	48	585	437	589	433	585	436	48	482	529	482	530	481	531
454.calculix	48	1080	367	1082	366	1085	365	48	1051	377	1047	378	1040	381
459.GemsFDTD	48	2358	216	2361	216	2362	216	48	2358	216	2361	216	2362	216
465.tonto	48	1711	276	1707	277	1709	276	48	967	488	966	489	963	490
470.lbm	48	1121	588	1121	588	1122	588	48	1121	588	1121	588	1122	588
481.wrf	48	1426	376	1425	376	1425	376	48	1248	430	1257	426	1250	429
482.sphinx3	48	2370	395	2363	396	2369	395	48	2370	395	2363	396	2369	395

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

Peak Tuning Notes

IBM Post-Link Optimization tool with options "-O4 -nodp" used for 433.milc 435.gromacs 436.cactusADM 450.soplex 482.sphinx3
 options "-O4 -vrox -nodp" used for 434.zeusmp
 options "-O3 -lu -l -nodp -sdp 9" used for 437.leslie3d 444.namd
 options "-O4" used for 465.tonto



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Submit Notes

The config file option 'submit' was used.
Benchmarks bound to a processor using numactl on the submit command.

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

447.dealII (peak): "apache_stdclx_4_2_1" src.alt was used.
447.dealII (base): "apache_stdclx_4_2_1" src.alt was used.

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

Base Compiler Invocation

C benchmarks:
xlc -qlanglvl=extc99

C++ benchmarks:
xlC

Fortran benchmarks:
xlf95

Benchmarks using both Fortran and C:
xlc -qlanglvl=extc99 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: -DNOUNDERSCORE
482.sphinx3: -qchars=signed



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Base Optimization Flags

C benchmarks:

-O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -lhugetlbfs

C++ benchmarks:

-O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qrtti -lhugetlbfs

Fortran benchmarks:

-O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsmallstack=dynlenonheap
-qalias=nostd -lhugetlbfs

Benchmarks using both Fortran and C:

-O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsmallstack=dynlenonheap
-qalias=nostd -lhugetlbfs

Base Other Flags

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

Peak Compiler Invocation

C benchmarks:

xlc -qlanglvl=extc99

C++ benchmarks:

x1C

Fortran benchmarks:

x1f95

Benchmarks using both Fortran and C:

xlc -qlanglvl=extc99 x1f95

Peak Portability Flags

410.bwaves: -qfixed

416.gamess: -qfixed

434.zeusmp: -qfixed

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Peak Portability Flags (Continued)

435.gromacs: -qfixed -qextname
 436.cactusADM: -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: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

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
-qcpp_stdinc=/autobench/sources/stdcxx-4.2.1/dist/include/ansi:/autobench/sources/stdcxx-4.2.1/dist/include:/opt/ibmcomp/vacpp/11.1/incl
-lsmartheap -L/autobench/sources/stdcxx-4.2.1/dist/lib
-R/autobench/sources/stdcxx-4.2.1/dist/lib -lstl8d

450.soplex: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qtune=auto
-qarch=pwr5 -lhugetlbfs

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

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Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

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: basepeak = yes

454.calculix: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7
-qipa=threads -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-align

481.wrf: -O3 -qarch=pwr7 -qtune=pwr7 -qipa=threads -q64
-lhugetlbfs

Peak Other Flags

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20110426.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20110426.xml>

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.1.

Report generated on Wed Jul 23 18:39:30 2014 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 26 April 2011.