SPEC® CFP2006 Result

IBM Corporation

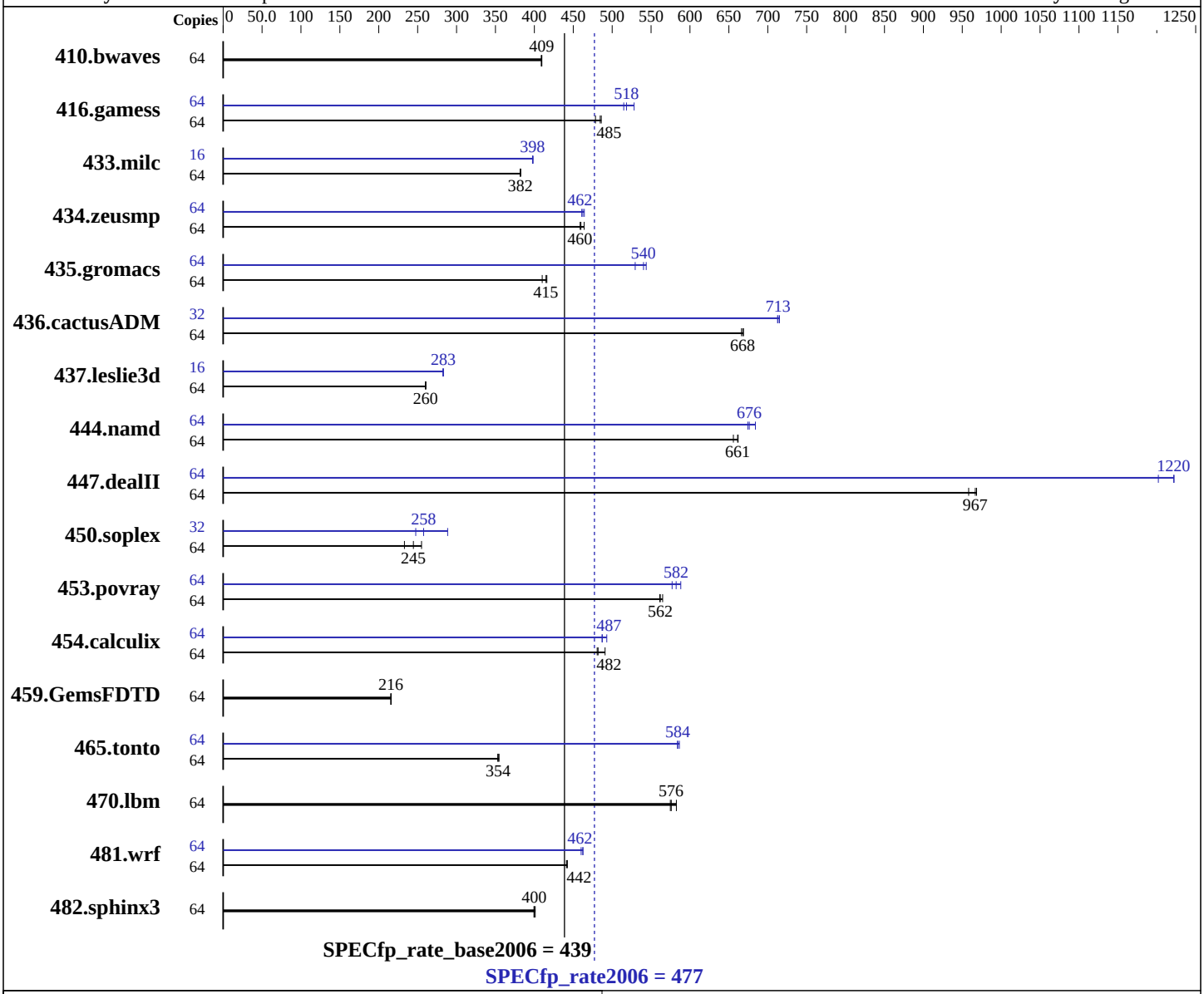
IBM Power 730 Express (3.55 GHz, 16 core, SLES)

SPECfp®_rate2006 = 477

SPECfp_rate_base2006 = 439

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

Test date: Jul-2010
Hardware Availability: Sep-2010
Software Availability: Aug-2010



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.86 GHz
CPU MHz:	3556
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 SP1 (ppc64), Kernel 2.6.32.12-0.7-ppc64
Compiler:	IBM XL C/C++ for Linux, V11.1 IBM XL Fortran for Linux, V13.1
Auto Parallel:	No
File System:	ext3
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit

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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 (16x8 GB) DDR3 1066 MHz
Disk Subsystem: 2x146.8 GB SAS SFF 15K RPM
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: -Post-Link Optimization for Linux on POWER, Version 5.5.0-3
-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	2123	410	2127	409	**2124**	**409**	64	2123	410	2127	409	**2124**	**409**
416.gamess	64	2618	479	**2586**	**485**	2578	486	64	2372	528	2434	515	**2417**	**518**
433.milc	64	**1539**	**382**	1539	382	1536	383	16	**369**	**398**	369	398	369	398
434.zeusmp	64	**1267**	**460**	1269	459	1255	464	64	1255	464	1264	461	**1260**	**462**
435.gromacs	64	1114	410	**1101**	**415**	1098	416	64	**846**	**540**	840	544	863	530
436.cactusADM	64	1148	666	1144	669	**1145**	**668**	32	535	715	537	713	**536**	**713**
437.leslie3d	64	2314	260	2308	261	**2312**	**260**	16	532	283	531	283	**532**	**283**
444.namd	64	783	656	775	662	**776**	**661**	64	**759**	**676**	761	674	750	684
447.dealII	64	764	958	**757**	**967**	756	968	64	609	1200	599	1220	**599**	**1220**
450.soplex	64	2291	233	**2183**	**245**	2093	255	32	1078	248	**1036**	**258**	925	289
453.povray	64	607	561	603	565	**606**	**562**	64	**585**	**582**	579	588	590	577
454.calculix	64	1076	491	1098	481	**1096**	**482**	64	1071	493	**1083**	**487**	1084	487
459.GemsFDTD	64	3150	216	**3147**	**216**	3147	216	64	3150	216	**3147**	**216**	3147	216
465.tonto	64	1784	353	**1781**	**354**	1776	355	64	1074	586	**1078**	**584**	1078	584
470.lbm	64	1510	583	1530	575	**1527**	**576**	64	1510	583	1530	575	**1527**	**576**
481.wrf	64	1617	442	**1617**	**442**	1620	441	64	1554	460	**1546**	**462**	1546	462
482.sphinx3	64	3122	399	**3118**	**400**	3110	401	64	3122	399	**3118**	**400**	3110	401

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:
  433.milc 435.gromacs 450.soplex 482.sphinx3
     with options -O4 -nodp
  434.zeusmp
     with options -O4 -vrox -nodp
  437.leslie3d 444.namd
     with options -O3 -lu -1 -nodp -sdp 9
  465.tonto
     with options -O4
```

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 varibles were set before the runspec command:
    export XLFRTEOPTS=intrinthds=1
    export HUGETLB_VERBOSE=0
    export HUGETLB_MORECORE=yes
    export HUGETLB_ELFMAP=RW
```

General Notes

```
447.dealII (peak): "apache_stdcxx_4_2_1" src.alt was used.
447.dealII (base): "apache_stdcxx_4_2_1" src.alt was used.

The Apache C++ Standard Library V4.2.1 was installed from
http://stdcxx.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

Continued on next page

Base Portability Flags (Continued)

437.leslie3d: `-qfixed`
454.calculix: `-qfixed -qextname`
481.wrf: `-DNOUNDERSCORE`
482.sphinx3: `-qchars=signed`

Base Optimization Flags

C benchmarks:
`-O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs`

C++ benchmarks:
`-O5 -qarch=pwr7 -qtune=pwr7 -qrtti -lhugetlbfs`

Fortran benchmarks:
`-O5 -qarch=pwr7 -qtune=pwr7 -qsmallstack=dynlenonheap -qalias=nostd -lhugetlbfs`

Benchmarks using both Fortran and C:
`-O5 -qarch=pwr7 -qtune=pwr7 -qsmallstack=dynlenonheap -qalias=nostd -lhugetlbfs`

Base Other Flags

C benchmarks:
`-qipa=threads`

C++ benchmarks:
`-qipa=threads`

Fortran benchmarks:
`-qipa=threads`

Benchmarks using both Fortran and C:
`-qipa=threads`

Peak Compiler Invocation

C benchmarks:
`xlc -qlanglvl=extc99`

C++ benchmarks:
`xlC`

Continued on next page

Peak Compiler Invocation (Continued)

Fortran benchmarks:
xlf95

Benchmarks using both Fortran and C:
xlc -qlanglvl=extc99 xlf95

Peak Portability Flags

410.bwaves: -qfixed
416.gamess: -qfixed
434.zeusmp: -qfixed
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: -Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs

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 -lhugetlbfs

447.dealII: -O4 -qarch=pwr7 -qtune=pwr7 -qrtti
-qcpp_stdinc=/autobench/sources/stdcxx-4.2.1/dist/include/ansi:/autobench/sources/stdcxx-4.2.1/dist/ir
-lsmartheap -L/autobench/sources/stdcxx-4.2.1/dist/lib
-R/autobench/sources/stdcxx-4.2.1/dist/lib -lstd8d

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

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

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Peak Optimization Flags (Continued)

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -qalias=nostd -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

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

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

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

436.cactusADM: -O5 -qarch=pwr7 -qtune=pwr7 -qnostrict -qsmallstack=dynlenonheap -qalias=nostd -lhugetlbfs

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

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

Peak Other Flags

C benchmarks:
-qipa=threads

C++ benchmarks:
-qipa=threads

Fortran benchmarks:
-qipa=threads

Benchmarks using both Fortran and C:
-qipa=threads

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20100901.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20100901.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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