SPEC® CFP2006 Result

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IBM Corporation

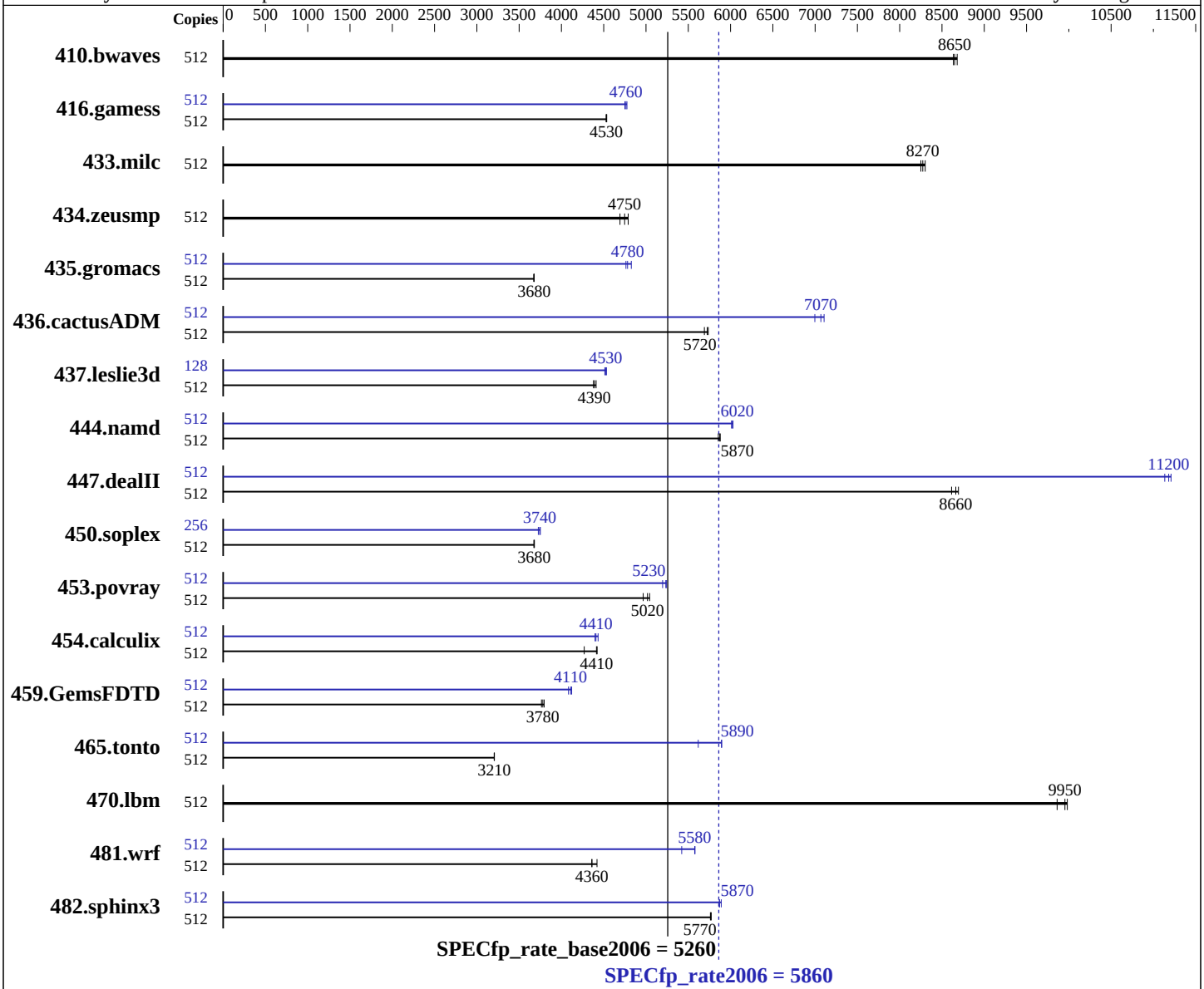
IBM Power 795 (4.25 GHz, 128 core, SLES)

SPECfp®_rate2006 = 5860

SPECfp_rate_base2006 = 5260

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

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



Hardware

CPU Name:	POWER7
CPU Characteristics:	TurboCore mode
CPU MHz:	4256
FPU:	Integrated
CPU(s) enabled:	128 cores, 32 chips, 4 cores/chip, 4 threads/core
CPU(s) orderable:	48 - 128 cores
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+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:	xfs
System State:	Run level 5 (multi-user)
Base Pointers:	32-bit

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L3 Cache: 4 MB I+D on chip per core
Other Cache: 16 MB I+D on chip per chip
Memory: 2 TB (256x8 GB) DDR3 1066 MHz
Disk Subsystem: 17x146.8 GB Raid0 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	512	802	8680	**804**	**8650**	806	8630	512	802	8680	**804**	**8650**	806	8630
416.gamess	512	2210	4540	2213	4530	**2212**	**4530**	512	**2105**	**4760**	2100	4770	2110	4750
433.milc	512	566	8300	570	8250	**568**	**8270**	512	566	8300	570	8250	**568**	**8270**
434.zeusmp	512	973	4790	993	4690	**981**	**4750**	512	973	4790	993	4690	**981**	**4750**
435.gromacs	512	994	3680	996	3670	**994**	**3680**	512	767	4760	757	4830	**764**	**4780**
436.cactusADM	512	1075	5690	**1069**	**5720**	1067	5740	512	**866**	**7070**	874	7000	861	7110
437.leslie3d	512	1091	4410	1099	4380	**1096**	**4390**	128	267	4510	265	4530	**266**	**4530**
444.namd	512	**699**	**5870**	701	5860	699	5880	512	**682**	**6020**	681	6030	683	6010
447.dealII	512	674	8690	680	8610	**676**	**8660**	512	526	11100	523	11200	**524**	**11200**
450.soplex	512	**1161**	**3680**	1160	3680	1162	3670	256	569	3750	**570**	**3740**	573	3730
453.povray	512	540	5040	548	4970	**543**	**5020**	512	524	5200	**520**	**5230**	519	5240
454.calculix	512	989	4270	955	4420	**957**	**4410**	512	961	4400	953	4430	**958**	**4410**
459.GemsFDTD	512	1431	3800	**1437**	**3780**	1443	3760	512	**1322**	**4110**	1318	4120	1330	4080
465.tonto	512	**1571**	**3210**	1571	3210	1572	3200	512	897	5620	**855**	**5890**	855	5900
470.lbm	512	713	9860	**707**	**9950**	705	9980	512	713	9860	**707**	**9950**	705	9980
481.wrf	512	**1312**	**4360**	1294	4420	1312	4360	512	1055	5420	1025	5580	**1026**	**5580**
482.sphinx3	512	1730	5770	**1730**	**5770**	1732	5760	512	**1700**	**5870**	1701	5870	1694	5890

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 436.cactusADM 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 34304 > /proc/sys/vm/nr_hugepages
The following environment varibles were set before the runspec command:
      export HUGETLB_VERBOSE=0
      export HUGETLB_MORECORE=yes
      export HUGETLB_ELFMAP=W
      export XLFRTEOPTS=intrinthds=1
```

General Notes

```
 447.dealII (peak): "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
437.leslie3d: -qfixed
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE

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Base Portability Flags (Continued)

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 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align`

Benchmarks using both Fortran and C:
`-O5 -qarch=pwr7 -qtune=pwr7 -qsmallstack=dynlenonheap -qalias=nostd -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align`

Base Other Flags

C benchmarks:
`-qipa=noobject -qipa=threads`

C++ benchmarks:
`-qipa=noobject -qipa=threads`

Fortran benchmarks:
`-qipa=noobject -qipa=threads`

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

Peak Compiler Invocation

C benchmarks:
`xlc -qlanglvl=extc99`

C++ benchmarks:
`xlC`

Fortran benchmarks:
`xlf95`

Continued on next page

Peak Compiler Invocation (Continued)

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: -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: basepeak = yes

470.lbm: basepeak = yes

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

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=/root/stdcxx421/include/ansi:/root/stdcxx421/include
-lsmartheap -lhugetlbfs -L/root/stdcxx421/lib
-R/root/stdcxx421/lib -lstd8d

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 -qsimd -q64 -lsmartheap64

Fortran benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

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

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

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: -Wl,-q -O4 -qarch=pwr7 -qtune=pwr7 -qsimd -qnostrict -q64 -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=noobject -qipa=threads

C++ benchmarks:
-qipa=noobject -qipa=threads

Fortran benchmarks:
-qipa=noobject -qipa=threads

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

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