SPEC® CFP2006 Result

IBM Corporation

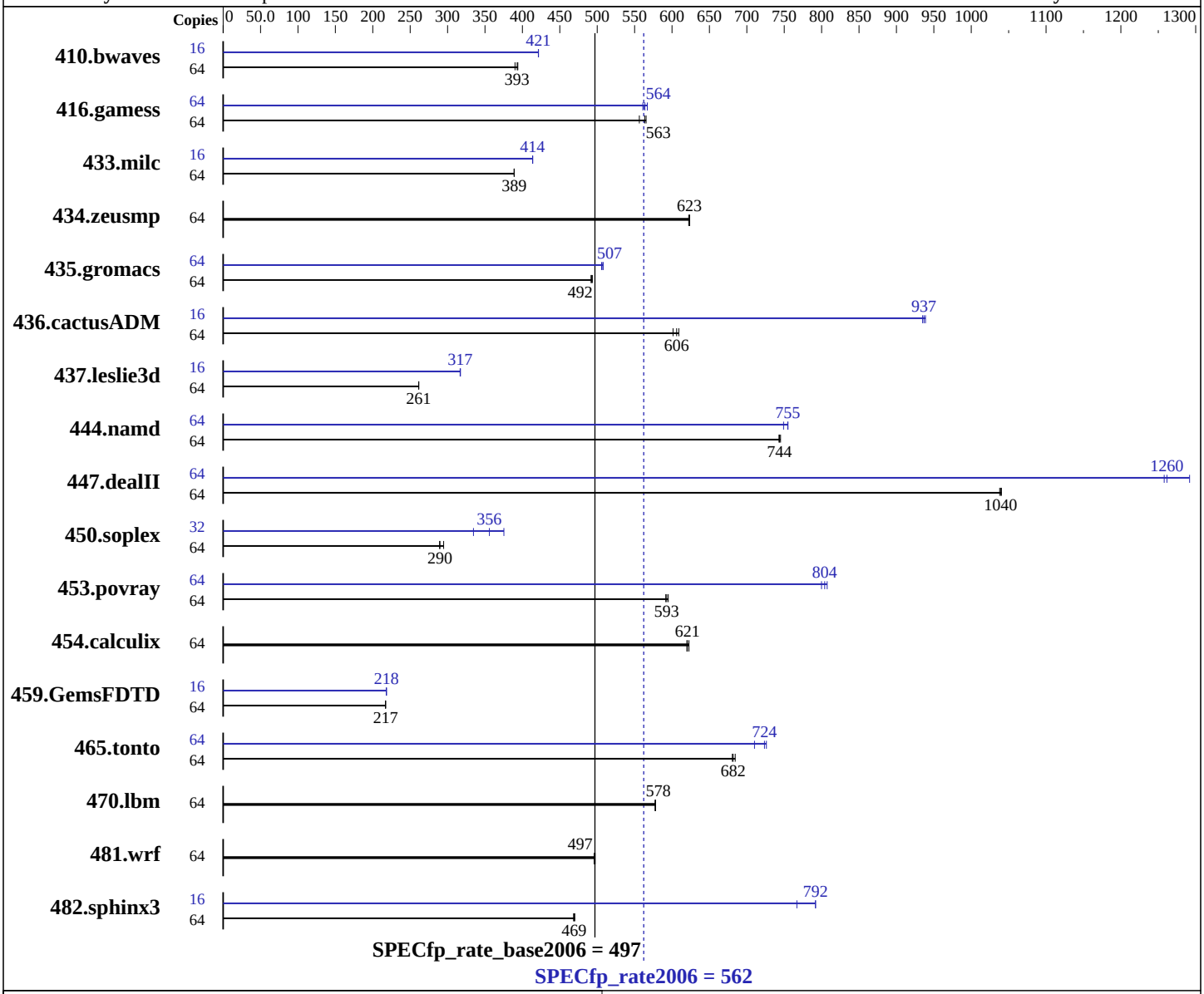
IBM Flex System p260 (4.1 GHz, 16 core, SLES)

SPECfp®_rate2006 = 562

SPECfp_rate_base2006 = 497

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

Test date: Nov-2012
Hardware Availability: Dec-2012
Software Availability: Dec-2012



Hardware

CPU Name:	POWER7+
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 4.340 GHz
CPU MHz:	4116
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

Continued on next page

Software

Operating System:	SUSE Linux Enterprise Server 11 SP2 (ppc64) kernel 3.0.13-0.27-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 600 GB SAS SFF 10K 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	2208	394	2229	390	**2213**	**393**	16	**516**	**421**	516	421	516	422
416.gamess	64	2252	556	2216	565	**2224**	**563**	64	2234	561	**2223**	**564**	2210	567
433.milc	64	1510	389	**1510**	**389**	1510	389	16	355	414	**355**	**414**	355	414
434.zeusmp	64	934	624	936	622	**935**	**623**	64	934	624	936	622	**935**	**623**
435.gromacs	64	926	494	**928**	**492**	929	492	64	903	506	**900**	**507**	900	508
436.cactusADM	64	1272	601	1256	609	**1262**	**606**	16	204	935	**204**	**937**	204	939
437.leslie3d	64	2301	261	2302	261	**2301**	**261**	16	475	317	474	317	**474**	**317**
444.namd	64	689	745	**690**	**744**	691	743	64	685	749	680	755	**680**	**755**
447.dealII	64	705	1040	**704**	**1040**	704	1040	64	567	1290	**580**	**1260**	582	1260
450.soplex	64	**1842**	**290**	1845	289	1811	295	32	798	335	**750**	**356**	711	375
453.povray	64	**574**	**593**	576	592	572	595	64	422	807	**423**	**804**	426	800
454.calculix	64	848	623	**851**	**621**	852	620	64	848	623	**851**	**621**	852	620
459.GemsFDTD	64	3129	217	3127	217	**3128**	**217**	16	778	218	778	218	**778**	**218**
465.tonto	64	920	685	925	681	**924**	**682**	64	867	726	**870**	**724**	887	710
470.lbm	64	1523	577	1521	578	**1522**	**578**	64	1523	577	1521	578	**1522**	**578**
481.wrf	64	**1439**	**497**	1442	496	1438	497	64	**1439**	**497**	1442	496	1438	497
482.sphinx3	64	2653	470	**2659**	**469**	2663	468	16	407	767	394	792	**394**	**792**

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
 437.leslie3d
      with options -O3 -lu -1 -nodp -sdp 9
 444.namd
```

Continued on next page

Peak Tuning Notes (Continued)

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

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

```
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

Additional filesystem options:
data=writeback,noatime

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

Platform Notes

```
This Compute Node is housed in an "IBM Flex System Enterprise Chassis"

The Maximum Power Limit for this Compute Node was set according to
recommendation on "IBM Chassis Management Module"
```

Base Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

Fortran benchmarks:
```
xlf95
```

Continued on next page

Base Compiler Invocation (Continued)

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

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

C++ benchmarks:
xlC

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: -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
-qcpp_stdinc=/opt/stdcxx421/include/ansi:/opt/stdcxx421/include:/opt/ibmcmp/vacpp/12.1/i
-lsmartheap -L/opt/stdcxx421/lib -R/opt/stdcxx421/lib
-lstd8d

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Peak Optimization Flags (Continued)

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

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.20121205.html
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/IBM-Power.20121205.xml
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.xml

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

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