SPEC® CFP2006 Result

IBM Corporation

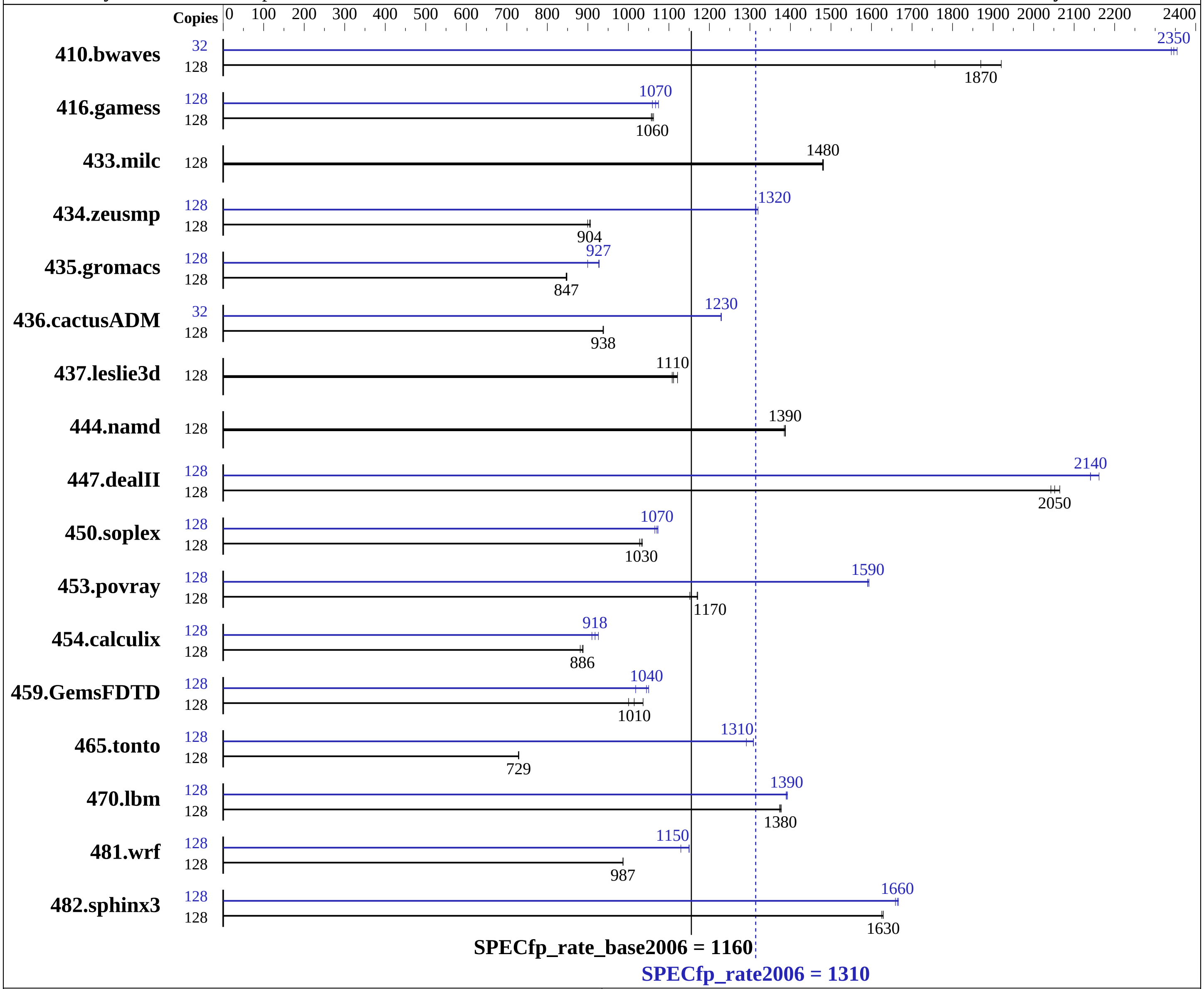
IBM Power 780 (4.14 GHz, 32 core, SLES)

SPECfp®_rate2006 = 1310

SPECfp_rate_base2006 = 1160

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

Test date: Mar-2010
Hardware Availability: Mar-2010
Software Availability: Dec-2009



Hardware

CPU Name:	POWER7
CPU Characteristics:	TurboCore mode
CPU MHz:	4140
FPU:	Integrated
CPU(s) enabled:	32 cores, 8 chips, 4 cores/chip, 4 threads/core
CPU(s) orderable:	8,16,24,32,48,64 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 (ppc64), Kernel 2.6.27.19-5-ppc64
Compiler:	IBM XL C/C++ for Linux, V10.1 Updated with the Oct2009 PTF IBM XL Fortran for Linux, V12.1 Updated with the Oct2009 PTF
Auto Parallel:	No
File System:	ext3

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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: 512 GB (64x8 GB) DDR3 1066 MHz
Disk Subsystem: 6x146.8 GB SAS SFF 15K RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: -Post-Link Optimization for Linux on POWER, Version 5.5.0-1
-MicroQuill SmartHeap 9

Results Table

	Base							Peak						
Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	906	1920	990	1760	**930**	**1870**	32	185	2350	186	2340	**185**	**2350**
416.gamess	128	**2367**	**1060**	2360	1060	2372	1060	128	2366	1060	2333	1070	**2349**	**1070**
433.milc	128	794	1480	**794**	**1480**	793	1480	128	794	1480	**794**	**1480**	793	1480
434.zeusmp	128	**1288**	**904**	1285	906	1295	899	128	**886**	**1320**	887	1310	882	1320
435.gromacs	128	1077	848	**1079**	**847**	1080	846	128	**986**	**927**	985	928	1016	900
436.cactusADM	128	1632	937	**1631**	**938**	1629	939	32	311	1230	**311**	**1230**	311	1230
437.leslie3d	128	1073	1120	**1083**	**1110**	1086	1110	128	1073	1120	**1083**	**1110**	1086	1110
444.namd	128	740	1390	741	1380	**740**	**1390**	128	740	1390	741	1380	**740**	**1390**
447.dealII	128	709	2060	**714**	**2050**	717	2040	128	677	2160	**684**	**2140**	684	2140
450.soplex	128	1039	1030	**1035**	**1030**	1032	1030	128	**997**	**1070**	1002	1070	995	1070
453.povray	128	581	1170	591	1150	**582**	**1170**	128	428	1590	**428**	**1590**	427	1590
454.calculix	128	1189	888	1199	881	**1191**	**886**	128	**1151**	**918**	1160	910	1140	926
459.GemsFDTD	128	1357	1000	**1339**	**1010**	1310	1040	128	**1300**	**1040**	1334	1020	1293	1050
465.tonto	128	**1727**	**729**	1729	729	1726	730	128	975	1290	962	1310	**963**	**1310**
470.lbm	128	1277	1380	1281	1370	**1279**	**1380**	128	1263	1390	1266	1390	**1265**	**1390**
481.wrf	128	1449	986	1448	987	**1449**	**987**	128	1243	1150	**1244**	**1150**	1266	1130
482.sphinx3	128	1531	1630	**1532**	**1630**	1535	1630	128	1504	1660	1497	1670	**1499**	**1660**

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

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 8448 > /proc/sys/vm/nr_hugepages
System configured with libhugetlbfs library for application access to large pages
Environment variables set before executing benchmarks.
    export HUGETLB_VERBOSE=0
    export HUGETLB_MORECORE=yes
    export XLFRTEOPTS=intrinthds=1
```

General Notes

```
IBM Post-Link optimization tool with
    options "-O4 -omullX -see 0 -m power6" used for
       433.milc 435.gromacs 436.cactusADM 482.sphinx3
    options "-O4 -omullX -see 1" used for
       436.cactusADM
    options "-O4 -omullX -see 1 -ihf -1" used for
       453.povray
    options "-O4" used for
       465.tonto
     Whenever option "-omullX" was used during the optimization phase,
       option "-imullX" was also used during the instrumentation phase.
```

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`

Base Optimization Flags

C benchmarks:
`-O5 -qnoenablevmx -lhugetlbfs`

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Base Optimization Flags (Continued)

C++ benchmarks:

-O5 -qrtti -qnoenablevmx -qstaticlink
-Wl,--whole-archive /usr/lib/libhugetlbfs.a -Wl,--no-whole-archive

Fortran benchmarks:

-O5 -qsmallstack=dynlenonheap -qalias=nostd -qnoenablevmx
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

-O5 -qnoenablevmx -qsmallstack=dynlenonheap -qalias=nostd
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

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

Benchmarks using both Fortran and C:

xlc -qlanglvl=extc99 xlf95

Peak Portability Flags

410.bwaves: -qfixed

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Peak Portability Flags (Continued)

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

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT -q64

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

C++ benchmarks:

444.namd: basepeak = yes

447.dealII: -O5 -qrtti -qnoenablevmx -qstaticlink -Wl,-z,muldefs -Wl,--whole-archive /usr/lib/libsmartheap.a -Wl,--no-whole-archive

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qstrict -lhugetlbfs

453.povray: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -lsmartheap

Fortran benchmarks:

410.bwaves: -O5 -qsmallstack=dynlenonheap -lhugetlbfs

416.gamess: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qalias=nostd -qnoenablevmx

434.zeusmp: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qxlf90=nosignedzero -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

437.leslie3d: basepeak = yes

459.GemsFDTD: -O5 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT -q64

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Peak Optimization Flags (Continued)

465.tonto: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -q64 -lsmartheap64

Benchmarks using both Fortran and C:

435.gromacs: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -lhugetlbfs

436.cactusADM: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O2 -qarch=auto -qtune=auto -qnostrict -lhugetlbfs

454.calculix: -O4 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

481.wrf: -O5 -qnoenablevmx -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.20100302.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20100302.xml

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

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