SPEC® CFP2006 Result

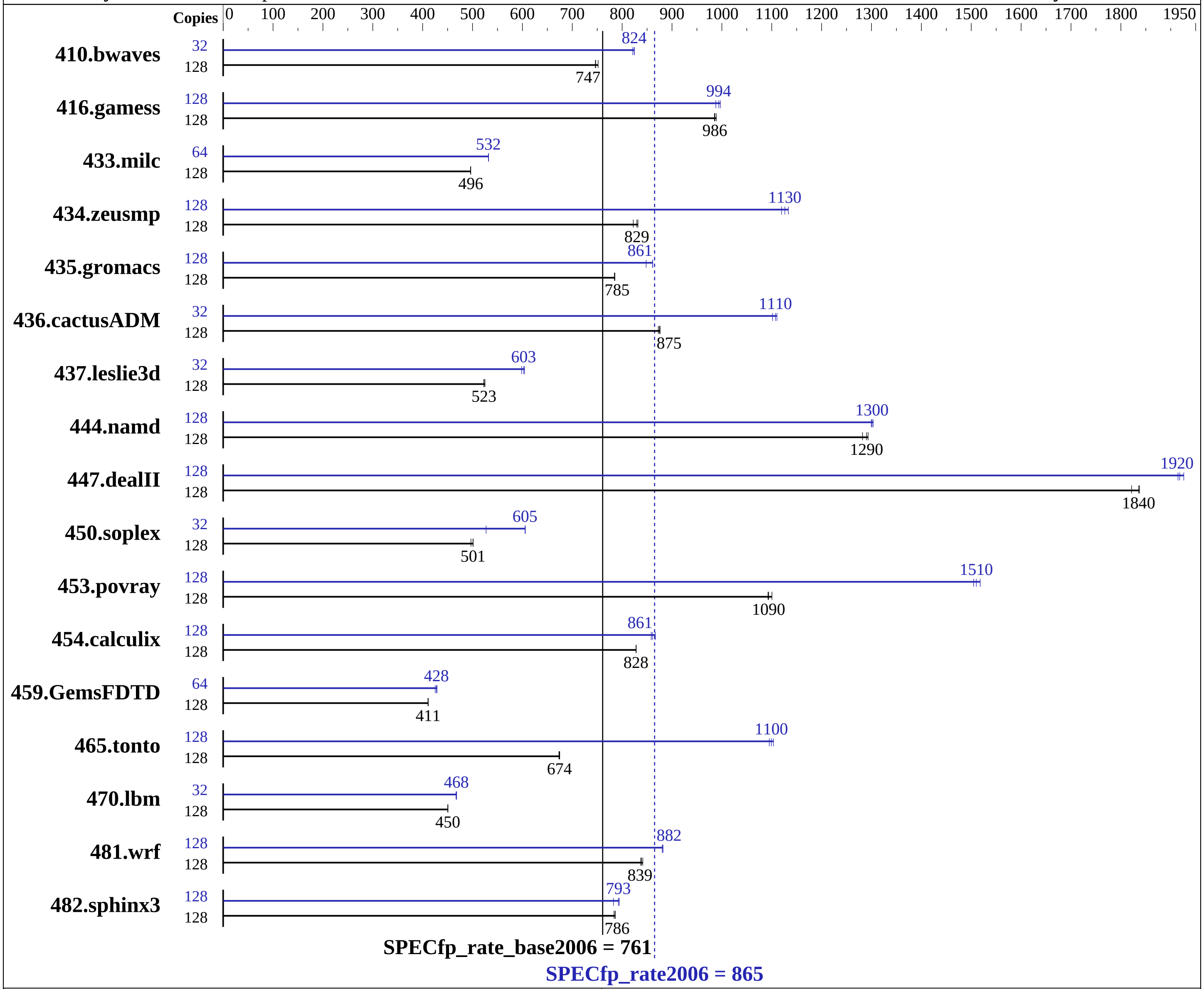
IBM Corporation

IBM Power 750 Express (3.55 GHz, 32 core, SLES)

SPECfp®_rate2006 = 865

SPECfp_rate_base2006 = 761

CPU2006 license:	11	**Test date:**	Jan-2010
Test sponsor:	IBM Corporation	**Hardware Availability:**	Feb-2010
Tested by:	IBM Corporation	**Software Availability:**	Dec-2009



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.86 GHz
CPU MHz:	3550
FPU:	Integrated
CPU(s) enabled:	32 cores, 4 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	8,16,24,32 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 (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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Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	4 MB I+D on chip per core
Other Cache:	None
Memory:	256 GB (32x8 GB) DDR3 1066 MHz
Disk Subsystem:	8x146.8 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

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	128	**2328**	**747**	2314	752	2331	746	32	527	825	529	821	**528**	**824**
416.gamess	128	2535	989	2544	985	**2542**	**986**	128	2514	997	2537	988	**2522**	**994**
433.milc	128	2369	496	**2367**	**496**	2366	497	64	1104	532	1104	532	**1104**	**532**
434.zeusmp	128	**1404**	**829**	1400	832	1417	822	128	**1034**	**1130**	1028	1130	1040	1120
435.gromacs	128	1165	785	**1165**	**785**	1164	785	128	**1061**	**861**	1078	848	1061	861
436.cactusADM	128	1753	872	1746	876	**1749**	**875**	32	347	1100	**345**	**1110**	344	1110
437.leslie3d	128	2292	525	2301	523	**2301**	**523**	32	498	604	503	599	**499**	**603**
444.namd	128	801	1280	**796**	**1290**	794	1290	128	790	1300	788	1300	**789**	**1300**
447.dealII	128	797	1840	**798**	**1840**	804	1820	128	760	1930	765	1910	**764**	**1920**
450.soplex	128	2148	497	2130	501	**2131**	**501**	32	506	527	**441**	**605**	440	606
453.povray	128	623	1090	619	1100	**623**	**1090**	128	453	1500	449	1520	**451**	**1510**
454.calculix	128	**1275**	**828**	1276	828	1275	828	128	**1227**	**861**	1219	867	1230	858
459.GemsFDTD	128	3307	411	3303	411	**3304**	**411**	64	**1588**	**428**	1597	425	1584	429
465.tonto	128	**1868**	**674**	1866	675	1871	673	128	1150	1100	1141	1100	**1146**	**1100**
470.lbm	128	3901	451	3904	450	**3904**	**450**	32	942	467	939	468	**940**	**468**
481.wrf	128	1699	841	1707	837	**1705**	**839**	128	**1621**	**882**	1624	880	1621	882
482.sphinx3	128	3183	784	3173	786	**3174**	**786**	128	3188	783	**3148**	**793**	3141	794

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.
```

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.

Benchmarks bound to a processor using numactl on the submit command.
See flags file for details on settings.
```

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`

Continued on next page

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: -Wl,-q -O5 -qnoenablevmx -lhugetlbfs

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: -qpdf1(pass 1) -qpdf2(pass 2) -O5

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

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Peak Optimization Flags (Continued)

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

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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