SPEC® CFP2006 Result

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IBM Corporation

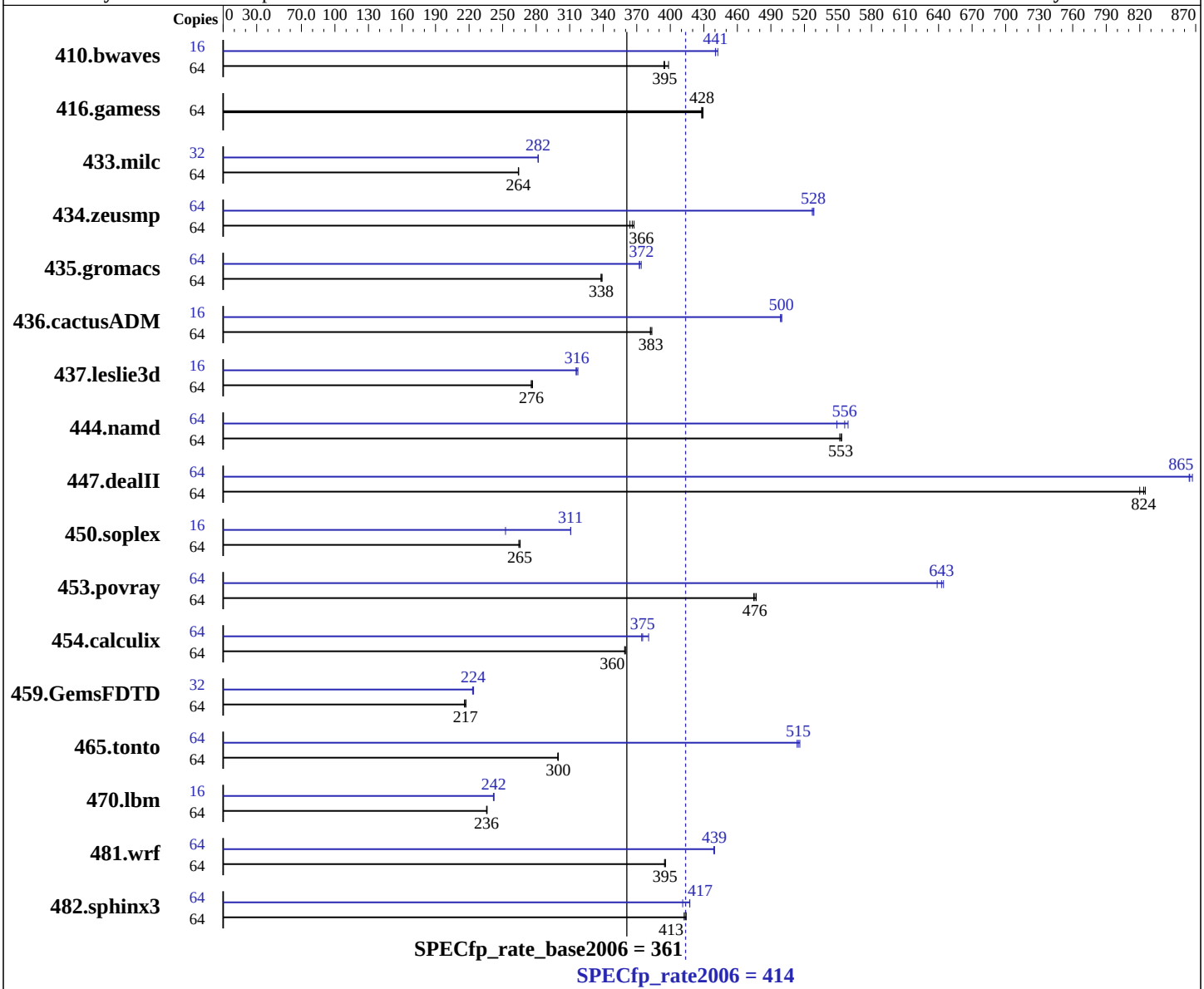
IBM BladeCenter PS702 Express (3.0 GHz, 16 core, SLES)

SPECfp®_rate2006 = 414

SPECfp_rate_base2006 = 361

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

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



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.30 GHz
CPU MHz:	3000
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 (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:	128 GB (32x4 GB) DDR3 1066 MHz
Disk Subsystem:	1x300 GB SAS SFF 10K 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	64	**2202**	**395**	2183	398	2206	394	16	491	443	**494**	**441**	494	440
416.gamess	64	**2925**	**428**	2919	429	2927	428	64	**2925**	**428**	2919	429	2927	428
433.milc	64	2225	264	2222	264	**2224**	**264**	32	**1042**	**282**	1043	282	1042	282
434.zeusmp	64	1584	368	1600	364	**1591**	**366**	64	**1103**	**528**	1102	528	1105	527
435.gromacs	64	**1351**	**338**	1352	338	1348	339	64	1222	374	**1227**	**372**	1227	372
436.cactusADM	64	**1999**	**383**	2001	382	1994	384	16	383	500	**383**	**500**	384	499
437.leslie3d	64	2182	276	2174	277	**2182**	**276**	16	**475**	**316**	476	316	474	317
444.namd	64	931	552	**929**	**553**	928	553	64	918	559	935	549	**923**	**556**
447.dealII	64	888	825	**889**	**824**	893	820	64	844	867	**847**	**865**	847	864
450.soplex	64	2018	264	2009	266	**2012**	**265**	16	528	253	429	311	**429**	**311**
453.povray	64	717	475	**716**	**476**	714	477	64	528	644	**530**	**643**	533	639
454.calculix	64	1470	359	**1468**	**360**	1467	360	64	1387	381	**1407**	**375**	1410	374
459.GemsFDTD	64	3147	216	3127	217	**3132**	**217**	32	**1518**	**224**	1522	223	1515	224
465.tonto	64	**2101**	**300**	2104	299	2100	300	64	1227	513	1221	516	**1224**	**515**
470.lbm	64	**3730**	**236**	3723	236	3730	236	16	908	242	909	242	**908**	**242**
481.wrf	64	1811	395	**1808**	**395**	1807	396	64	1627	440	1629	439	**1627**	**439**
482.sphinx3	64	3011	414	**3018**	**413**	3025	412	64	3034	411	**2989**	**417**	2988	418

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 4224 > /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`

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: basepeak = yes

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

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`

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