SPEC® CFP2006 Result

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IBM Corporation

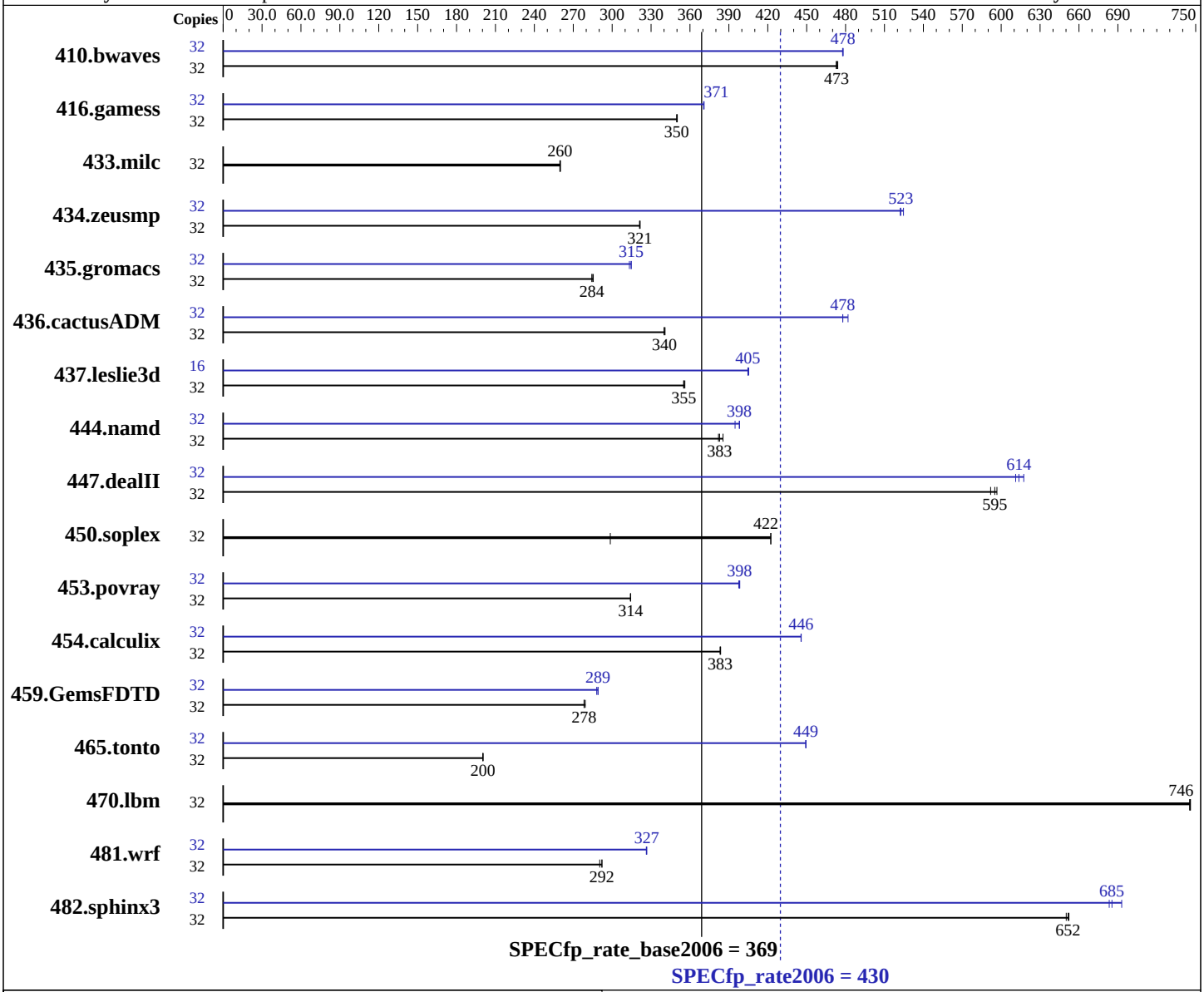
IBM System p 570 (4.7 GHz, 16 core, RHEL)

SPECfp®_rate2006 = 430

SPECfp_rate_base2006 = 369

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

Test date: Oct-2007
Hardware Availability: Jun-2007
Software Availability: Oct-2007



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	4700
FPU:	Integrated
CPU(s) enabled:	16 cores, 8 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	2,4,8,12,16 cores
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per core

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Software

Operating System:	Red Hat Enterprise Linux Advanced Platform 5.1 for IBM POWER
Compiler:	IBM XL C/C++ Advanced Edition for Linux, V9.0 IBM XL Fortran Advanced Edition for Linux, V11.1
Auto Parallel:	No
File System:	ext3
System State:	Multi-User
Base Pointers:	32-bit
Peak Pointers:	32/64-bit

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L3 Cache: 32 MB I+D off chip per chip
Other Cache: None
Memory: 128 GB (64x2 GB) DDR2 667 MHz
Disk Subsystem: 2x73 GB SAS 15K RPM
Other Hardware: None

Other Software: -IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-10
-MicroQuill SmartHeap 8.1
-IBM Engineering and Scientific Subroutine Library for Linux on POWER, Version 4.3

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	918	474	920	473	**919**	**473**	32	910	478	910	478	**910**	**478**
416.gamess	32	1789	350	1791	350	**1791**	**350**	32	1689	371	1691	371	**1690**	**371**
433.milc	32	1131	260	1129	260	**1131**	**260**	32	1131	260	1129	260	**1131**	**260**
434.zeusmp	32	**906**	**321**	906	322	907	321	32	**557**	**523**	555	525	558	522
435.gromacs	32	803	284	**803**	**284**	800	285	32	729	313	**726**	**315**	726	315
436.cactusADM	32	1125	340	1122	341	**1124**	**340**	32	794	482	**800**	**478**	800	478
437.leslie3d	32	847	355	**846**	**355**	845	356	16	**372**	**405**	372	405	371	405
444.namd	32	**670**	**383**	672	382	666	385	32	650	395	**645**	**398**	644	398
447.dealII	32	**615**	**595**	619	592	613	597	32	593	617	**597**	**614**	599	611
450.soplex	32	894	299	**632**	**422**	632	422	32	894	299	**632**	**422**	632	422
453.povray	32	542	314	**542**	**314**	542	314	32	427	398	**427**	**398**	428	398
454.calculix	32	689	383	**689**	**383**	688	384	32	592	446	592	446	**592**	**446**
459.GemsFDTD	32	1220	278	**1220**	**278**	1216	279	32	**1175**	**289**	1179	288	1174	289
465.tonto	32	1571	200	1573	200	**1572**	**200**	32	**701**	**449**	701	449	701	449
470.lbm	32	590	745	589	746	**590**	**746**	32	590	745	589	746	**590**	**746**
481.wrf	32	1231	290	**1224**	**292**	1224	292	32	1095	326	1094	327	**1094**	**327**
482.sphinx3	32	**957**	**652**	956	652	959	650	32	900	693	**910**	**685**	913	683

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

General Notes

```
kernel release 2.6.18-52.el5.

See flags file for details on following settings.

ulimit -s (stack) set to 262144.


System set to Enhanced mode when defining partition on HMC

Large pages reserved as follows by root user:
    echo 3200 > /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
```

Continued on next page

General Notes (Continued)

```
    export HUGETLB_MORECORE=yes
    export XLFRTEOPTS=intrinthds=1

fdpr binary optimization tool used for
    435.gromacs 436.cactusADM 482.sphinx3

Benchmarks bound to a processor using numactl on the submit command.
```

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
```

C++ benchmarks:
```
-O5 -qrtti -qnoenablevmx -qstaticlink
```

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

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Base Optimization Flags (Continued)

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`
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: basepeak = yes

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

C++ benchmarks:

444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6e -qtune=pwr6

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

450.soplex: basepeak = yes

453.povray: -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=pwr6e -qtune=pwr6
-qxlf90=nosignedzero -B/usr/share/libhugetlbfs/ -tl
-Wl,--hugetlbfs-link=BDT

437.leslie3d: -O3 -qarch=pwr6e -qtune=pwr6 -B/usr/share/libhugetlbfs/
-tl -Wl,--hugetlbfs-link=BDT -q64

459.GemsFDTD: -qpdf1(pass 1) -qpdf2(pass 2) -O5
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
-q64

465.tonto: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -lessl -lsmartheap
-lxlf90_r

Benchmarks using both Fortran and C:

435.gromacs: -Wl,-q -O2 -qarch=pwr6e -qtune=pwr6 -lhugetlbfs

436.cactusADM: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O2 -qarch=pwr6e
-qtune=pwr6 -lhugetlbfs

454.calculix: -qpdf1(pass 1) -qpdf2(pass 2) -O4
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT

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Peak Optimization Flags (Continued)

481.wrf: `-O5 -qnoenablevmx -qalias=nostd -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/lop-xl-flags.20090714.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/lop-xl-flags.20090714.xml`

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Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 14:36:55 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 27 November 2007.