SPEC® CFP2006 Result

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IBM Corporation

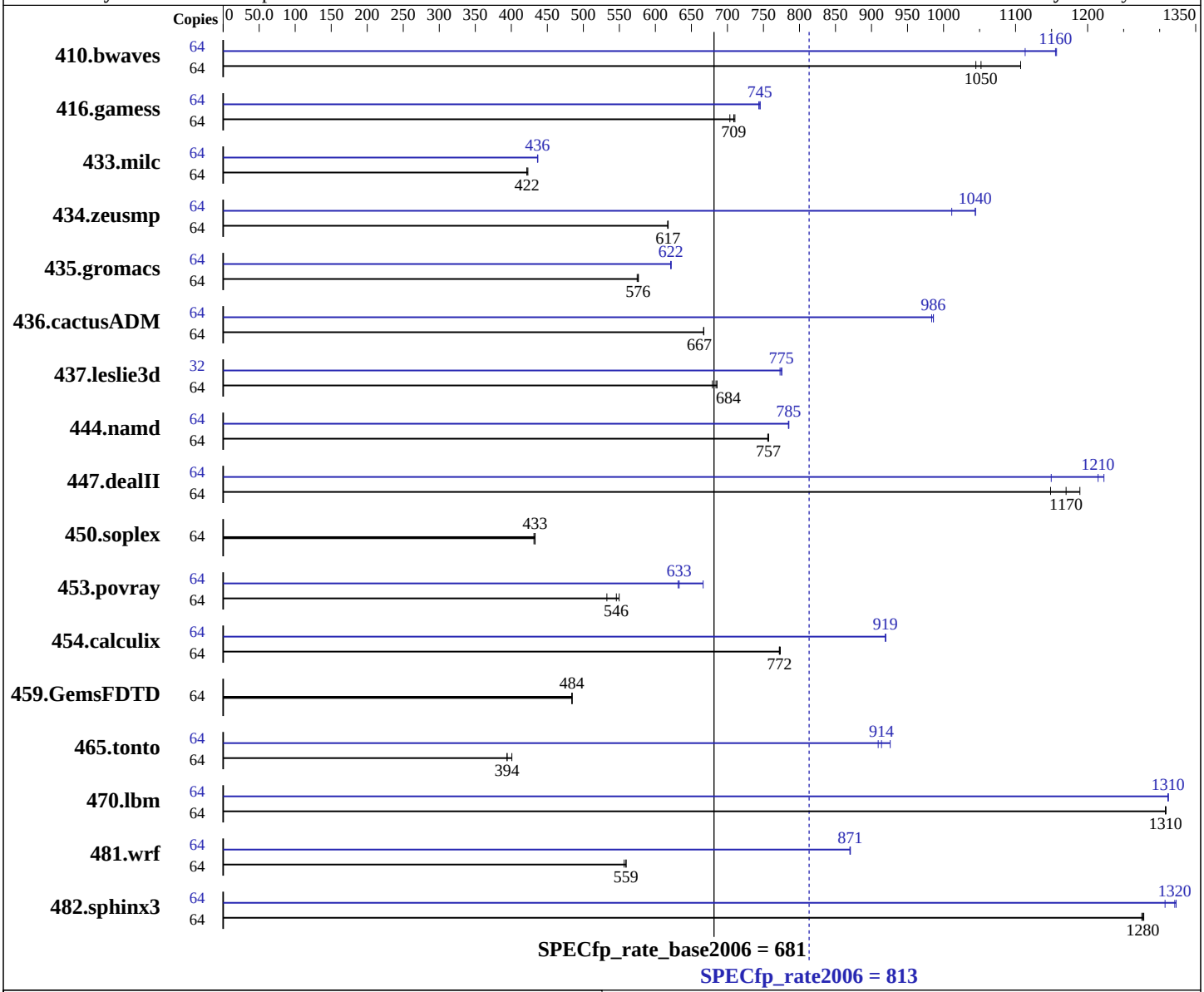
IBM Power 575 (4.7 GHz, 32 core, RedHat)

SPECfp®_rate2006 = 813

SPECfp_rate_base2006 = 681

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

Test date: May-2008
Hardware Availability: May-2008
Software Availability: May-2008



Hardware

CPU Name:	POWER6
CPU Characteristics:	
CPU MHz:	4700
FPU:	Integrated
CPU(s) enabled:	32 cores, 16 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	32 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 5.2 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:	Run level 3 (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 533 MHz
Disk Subsystem: 2x146 GB SFF SAS 10K RPM
Other Hardware: None

Other Software: -IBM Post-Link Optimization for Linux on POWER, Version 5.4.0-17
-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	64	786	1110	**827**	**1050**	832	1040	64	781	1110	752	1160	**753**	**1160**
416.gamess	64	**1768**	**709**	1782	703	1764	710	64	**1682**	**745**	1681	746	1685	744
433.milc	64	1389	423	**1393**	**422**	1393	422	64	**1346**	**436**	1345	437	1346	436
434.zeusmp	64	943	618	**943**	**617**	944	617	64	558	1040	**558**	**1040**	576	1010
435.gromacs	64	793	576	**793**	**576**	795	575	64	**735**	**622**	736	621	735	622
436.cactusADM	64	1147	667	1146	667	**1146**	**667**	64	**776**	**986**	778	984	776	986
437.leslie3d	64	**879**	**684**	886	679	877	686	32	388	776	**388**	**775**	389	773
444.namd	64	678	757	679	756	**678**	**757**	64	654	785	654	785	**654**	**785**
447.dealII	64	616	1190	637	1150	**626**	**1170**	64	599	1220	637	1150	**603**	**1210**
450.soplex	64	1233	433	1237	431	**1233**	**433**	64	1233	433	1237	431	**1233**	**433**
453.povray	64	619	550	639	533	**624**	**546**	64	**538**	**633**	511	666	539	632
454.calculix	64	684	772	**684**	**772**	683	773	64	574	919	**574**	**919**	574	920
459.GemsFDTD	64	1403	484	**1402**	**484**	1402	484	64	1403	484	**1402**	**484**	1402	484
465.tonto	64	**1598**	**394**	1598	394	1571	401	64	680	926	**689**	**914**	693	909
470.lbm	64	672	1310	**672**	**1310**	672	1310	64	670	1310	670	1310	**670**	**1310**
481.wrf	64	1278	559	**1279**	**559**	1284	557	64	821	871	822	870	**821**	**871**
482.sphinx3	64	976	1280	978	1280	**977**	**1280**	64	954	1310	**944**	**1320**	943	1320

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

General Notes

```
kernel release 2.6.18-91.el5.

See flags file for details on following settings.

ulimit -s (stack) set to 1048576.

System set to Enhanced mode when defining partition on HMC
System set to "Chip affinity" mode using the HMC command
  chsyscfg ... -i "addr_broadcast_perf_policy=chip_affinity"
Large pages reserved as follows by root user:
    echo 4240 > /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

IBM Post-Link optimization tool used for
    433.milc 435.gromacs 436.cactusADM 453.povray 465.tonto 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: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qnoenablevmx -lhugetlbfs`

470.lbm: `-O3 -qarch=pwr6e -qtune=pwr6 -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) `-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: `-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=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: `basepeak = yes`

465.tonto: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qessl -q64 -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 -qnostrict -lhugetlbfs`

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

Continued on next page

Peak Optimization Flags (Continued)

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.20090713.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20090713.00.xml`

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