SPEC® CFP2006 Result
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IBM Corporation

IBM Power 570 (4.2 GHz, 32 core, RedHat)

$SPECfp^{®}\_rate2006 =$ 592
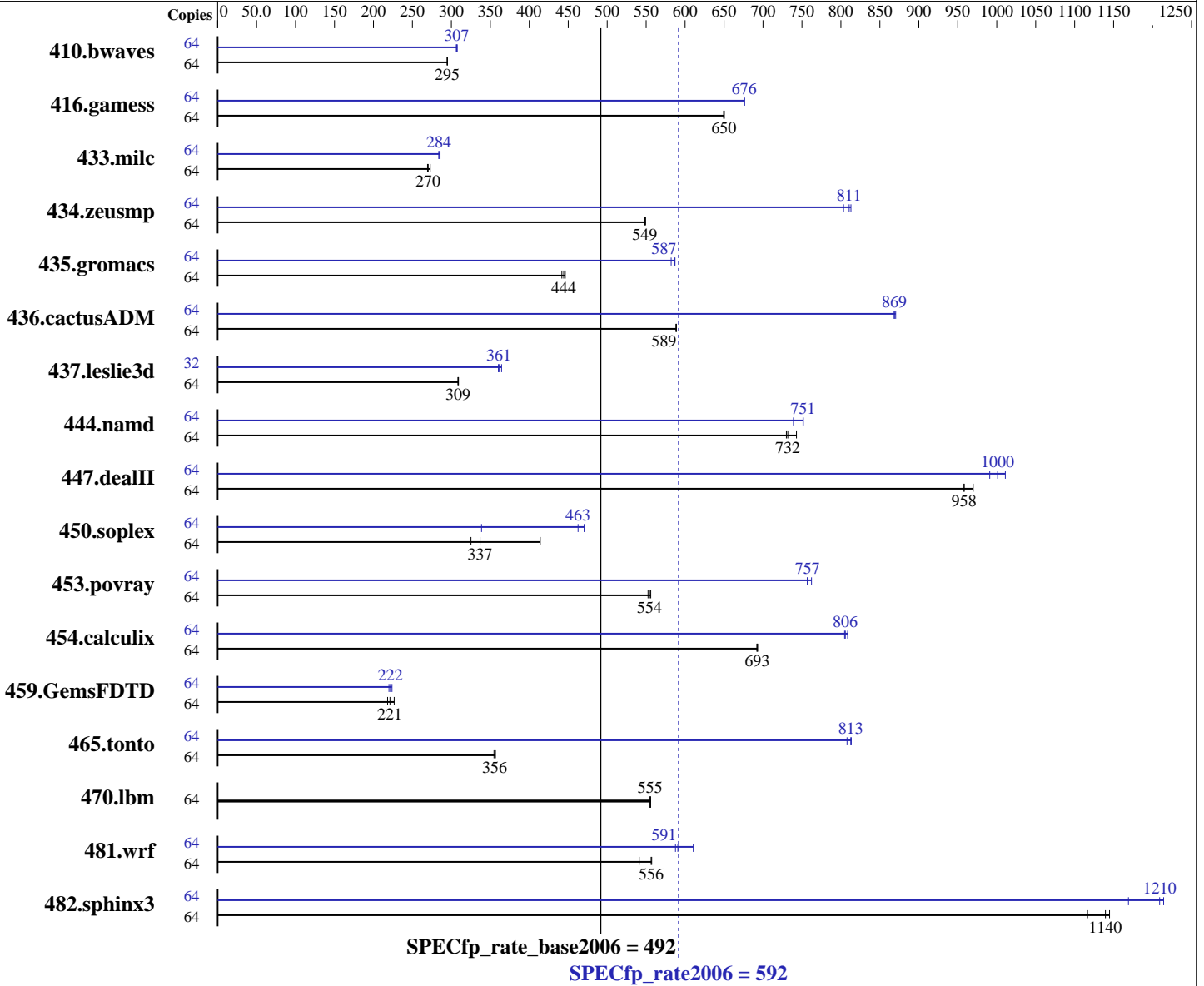
$SPECfp\_rate\_base2006 =$ 492

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

Test date: Sep-2008
Hardware Availability: Nov-2008
Software Availability: Sep-2008

Copies

Benchmark	Copies	Result
410.bwaves	64	307
410.bwaves	64	295
416.gamess	64	676
416.gamess	64	650
433.milc	64	284
433.milc	64	270
434.zeusmp	64	811
434.zeusmp	64	549
435.gromacs	64	587
435.gromacs	64	444
436.cactusADM	64	869
436.cactusADM	64	589
437.leslie3d	32	361
437.leslie3d	64	309
444.namd	64	751
444.namd	64	732
447.dealII	64	1000
447.dealII	64	958
450.soplex	64	463
450.soplex	64	337
453.povray	64	757
453.povray	64	554
454.calculix	64	806
454.calculix	64	693
459.GemsFDTD	64	222
459.GemsFDTD	64	221
465.tonto	64	813
465.tonto	64	356
470.lbm	64	555
481.wrf	64	591
481.wrf	64	556
482.sphinx3	64	1210
482.sphinx3	64	1140

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Hardware

CPU Name:	POWER6+
CPU Characteristics:	
CPU MHz:	4200
FPU:	Integrated
CPU(s) enabled:	32 cores, 16 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	4,8,16,24,32 cores
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	4 MB I+D on chip per core

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 5.2, Kernel 2.6.18-92.el5
Compiler:	IBM XL C/C++ for Linux, V10.1
	IBM XL Fortran for Linux, V12.1
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 Software: -IBM Post-Link Optimization for Linux on
Other Cache: None	POWER, Version 5.4.0-18
Memory: 128 GB (64x2 GB) DDR2 667 MHz	-MicroQuill SmartHeap 8.1
Disk Subsystem: 2x73 GB SAS 15K RPM	-IBM Engineering and Scientific Subroutine
Other Hardware: None	Library for Linux on POWER, Version 4.3.1

Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	64	**2950**	**295**	2950	295	2952	295	64	2828	308	**2834**	**307**	2839	306
416.gamess	64	1930	649	1927	650	**1928**	**650**	64	1853	676	**1854**	**676**	1855	676
433.milc	64	2153	273	**2174**	**270**	2181	269	64	2069	284	**2068**	**284**	2058	286
434.zeusmp	64	1062	549	1060	549	**1062**	**549**	64	**718**	**811**	725	803	716	813
435.gromacs	64	1034	442	1024	446	**1029**	**444**	64	785	582	**779**	**587**	778	587
436.cactusADM	64	1300	588	1299	589	**1299**	**589**	64	879	870	881	868	**880**	**869**
437.leslie3d	64	1946	309	**1949**	**309**	1950	309	32	825	364	835	360	**833**	**361**
444.namd	64	703	730	691	743	**701**	**732**	64	694	739	**683**	**751**	683	752
447.dealII	64	755	970	764	958	**764**	**958**	64	**731**	**1000**	739	991	724	1010
450.soplex	64	1642	325	1289	414	**1585**	**337**	64	1576	339	**1154**	**463**	1135	470
453.povray	64	616	552	**614**	**554**	612	556	64	**450**	**757**	447	762	450	757
454.calculix	64	762	693	**762**	**693**	763	692	64	656	805	653	809	**655**	**806**
459.GemsFDTD	64	3113	218	2997	227	**3070**	**221**	64	**3062**	**222**	3034	224	3088	220
465.tonto	64	1766	357	**1770**	**356**	1775	355	64	**775**	**813**	780	808	774	813
470.lbm	64	**1584**	**555**	1584	555	1582	556	64	**1584**	**555**	1584	555	1582	556
481.wrf	64	1321	541	**1285**	**556**	1283	557	64	1171	610	**1210**	**591**	1216	588
482.sphinx3	64	1117	1120	**1095**	**1140**	1090	1140	64	1067	1170	1027	1210	**1032**	**1210**

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.
```

General Notes

```
   See flags file for details on following settings.

   ulimit -s (stack) set to 1048576.



   Large pages reserved as follows by root user:
       echo 4480 > /proc/sys/vm/nr_hugepages
   System configured with libhugetlbfs library for application access to large pages
```

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Software Availability: Sep-2008

General Notes (Continued)

```
Environment variables set before executing benchmarks.
    export HUGETLB_VERBOSE=0
    export HUGETLB_MORECORE=yes
    export XLFRTEOPTS=intrinthds=1

IBM Post-Link optimization tool with options "-q -O4 -A 32 -shci 90 -sdp 9" used for
    433.milc 435.gromacs 436.cactusADM 453.povray 465.tonto 482.sphinx3
```

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 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -lhugetlbfs
```

C++ benchmarks:
```
-O5 -qarch=pwr6 -qtune=pwr6 -qrtti -qnoenablevmx -qstaticlink
```

Fortran benchmarks:
```
-O5 -qarch=pwr6 -qtune=pwr6 -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 -qarch=pwr6 -qtune=pwr6 -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
```

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Peak Optimization Flags

C benchmarks:

> 433.milc: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
> `-qtune=pwr6 -qnoenablevmx -lhugetlbfs`

> 470.lbm: `basepeak = yes`

> 482.sphinx3: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6`
> `-qtune=pwr6 -lhugetlbfs`

C++ benchmarks:

> 444.namd: `-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6`

> 447.dealII: `-O5 -qarch=pwr6 -qtune=pwr6 -qrtti -qnoenablevmx`
> `-qstaticlink -Wl,--whole-archive /usr/lib/libsmartheap.a`
> `-Wl,--no-whole-archive`

> 450.soplex: `-qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6 -qtune=pwr6`
> `-qstrict -lhugetlbfs`

> 453.povray: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
> `-qtune=pwr6 -lsmartheap`

Fortran benchmarks:

> 410.bwaves: `-O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap`
> `-lhugetlbfs`

> 416.gamess: `-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6`
> `-qalias=nostd -qnoenablevmx`

> 434.zeusmp: `-qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6 -qtune=pwr6`
> `-qxlf90=nosignedzero -B/usr/share/libhugetlbfs/ -tl`
> `-Wl,--hugetlbfs-link=BDT`

> 437.leslie3d: `-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6`
> `-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`
> `-q64`

> 459.GemsFDTD: `-O5 -qarch=pwr6 -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl`
> `-Wl,--hugetlbfs-link=BDT -q64`

> 465.tonto: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
> `-qtune=pwr6 -qessl -q64 -lessl -lsmartheap -lxlf90_r`

Benchmarks using both Fortran and C:

> 435.gromacs: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
> `-qtune=pwr6 -lhugetlbfs`

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Peak Optimization Flags (Continued)

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

   454.calculix: -O4 -qarch=pwr6 -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl
               -Wl,--hugetlbfs-link=BDT

        481.wrf: -O5 -qarch=pwr6 -qtune=pwr6 -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.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20090713.xml

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

Tested with SPEC CPU2006 v1.1.
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