SPEC® CFP2006 Result
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IBM Corporation

IBM BladeCenter HS22 (Intel Xeon X5687)

$SPECfp^{®}2006 =$ 64.9
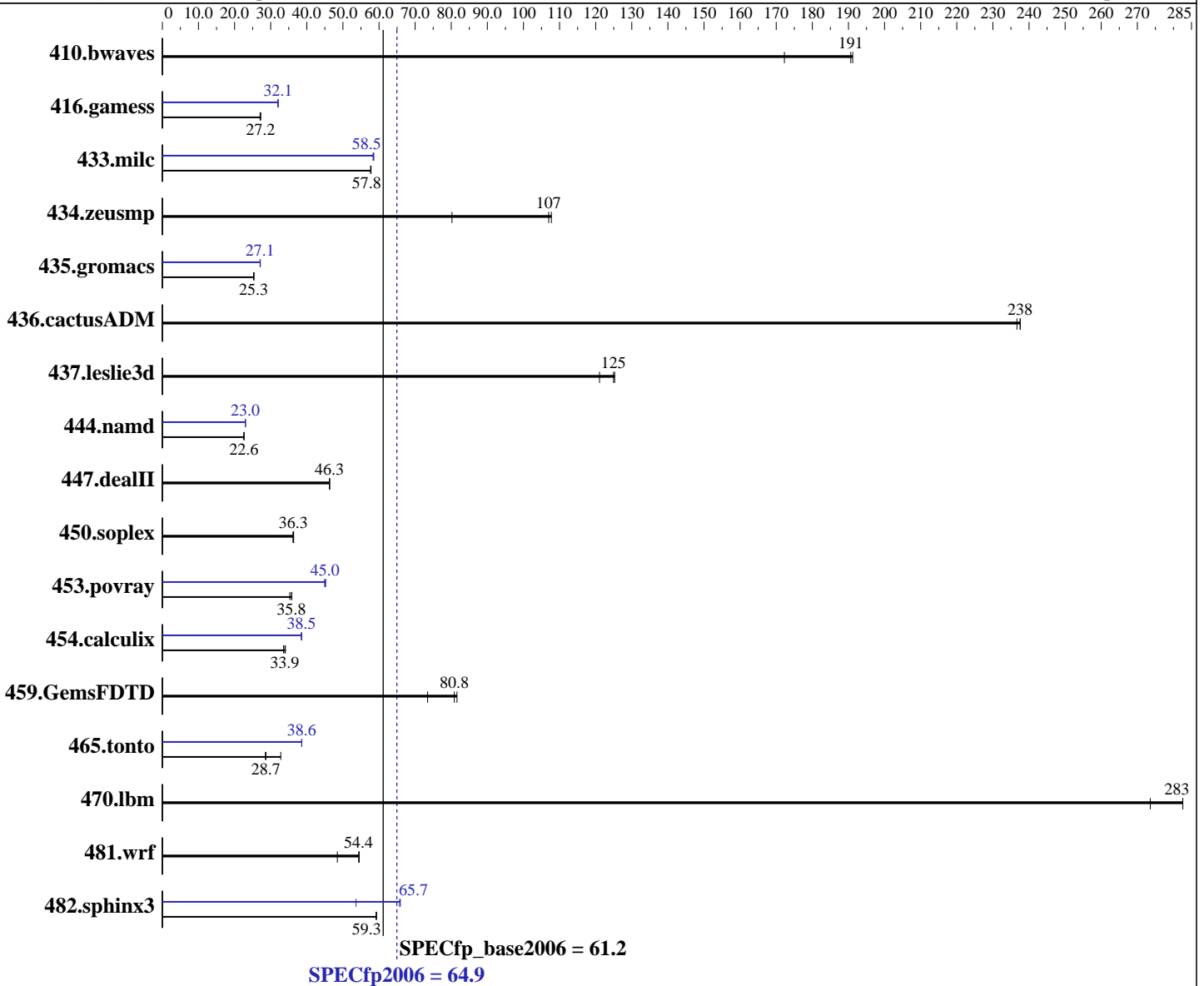
$SPECfp\_base2006 =$ 61.2

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

Test date: Jan-2011
Hardware Availability: Feb-2011
Software Availability: Apr-2011

Benchmark	Result
410.bwaves	191
416.gamess	32.1 / 27.2
433.milc	58.5 / 57.8
434.zeusmp	107
435.gromacs	27.1 / 25.3
436.cactusADM	238
437.leslie3d	125
444.namd	23.0 / 22.6
447.dealII	46.3
450.soplex	36.3
453.povray	45.0 / 35.8
454.calculix	38.5 / 33.9
459.GemsFDTD	80.8
465.tonto	38.6 / 28.7
470.lbm	283
481.wrf	54.4
482.sphinx3	65.7 / 59.3

SPECfp_base2006 = 61.2
SPECfp2006 = 64.9

Hardware

CPU Name: Intel Xeon X5687
CPU Characteristics: Intel Turbo Boost Technology up to 3.86 GHz
CPU MHz: 3600
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable: 1,2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Continued on next page

Software

Operating System: SuSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache:	12 MB I+D on chip per chip
Other Cache:	None
Memory:	48 GB (12 x 4 GB 2Rx8 PC3-10600R-9, ECC)
Disk Subsystem:	1 x 73 GB SAS, 10000 RPM
Other Hardware:	None

Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	78.9	172	**71.3**	**191**	71.1	191	78.9	172	**71.3**	**191**	71.1	191
416.gamess	724	27.1	719	27.2	**720**	**27.2**	612	32.0	**611**	**32.1**	610	32.1
433.milc	159	57.7	**159**	**57.8**	159	57.8	157	58.3	**157**	**58.5**	157	58.5
434.zeusmp	84.5	108	113	80.2	**85.1**	**107**	84.5	108	113	80.2	**85.1**	**107**
435.gromacs	283	25.3	281	25.4	**282**	**25.3**	264	27.1	263	27.1	**264**	**27.1**
436.cactusADM	**50.3**	**238**	50.3	238	50.5	237	**50.3**	**238**	50.3	238	50.5	237
437.leslie3d	77.6	121	**75.2**	**125**	75.0	125	77.6	121	**75.2**	**125**	75.0	125
444.namd	355	22.6	355	22.6	**355**	**22.6**	**349**	**23.0**	349	23.0	349	23.0
447.dealII	247	46.3	247	46.3	**247**	**46.3**	247	46.3	247	46.3	**247**	**46.3**
450.soplex	231	36.2	**230**	**36.3**	229	36.4	231	36.2	**230**	**36.3**	229	36.4
453.povray	149	35.8	**149**	**35.8**	151	35.3	**118**	**45.0**	118	45.2	118	45.0
454.calculix	242	34.1	**243**	**33.9**	246	33.6	214	38.5	214	38.6	**214**	**38.5**
459.GemsFDTD	130	81.6	**131**	**80.8**	144	73.5	130	81.6	**131**	**80.8**	144	73.5
465.tonto	300	32.8	**343**	**28.7**	345	28.5	**255**	**38.6**	255	38.6	255	38.6
470.lbm	50.2	274	**48.6**	**283**	48.6	283	50.2	274	**48.6**	**283**	48.6	283
481.wrf	230	48.5	**205**	**54.4**	205	54.5	230	48.5	**205**	**54.4**	205	54.5
482.sphinx3	**329**	**59.3**	329	59.2	329	59.3	363	53.6	**297**	**65.7**	296	65.9

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

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
Turbo Mode enabled in BIOS
Turbo Boost set to Traditional in BIOS
Power C-states enabled in BIOS
Demand Scrub disabled in BIOS
```

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General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries compiled on RHEL5.5
```

Base Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

Base Portability Flags

```
   410.bwaves: -DSPEC_CPU_LP64
   416.gamess: -DSPEC_CPU_LP64
     433.milc: -DSPEC_CPU_LP64
   434.zeusmp: -DSPEC_CPU_LP64
  435.gromacs: -DSPEC_CPU_LP64 -nofor_main
 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
  437.leslie3d: -DSPEC_CPU_LP64
     444.namd: -DSPEC_CPU_LP64
    447.dealII: -DSPEC_CPU_LP64
    450.soplex: -DSPEC_CPU_LP64
    453.povray: -DSPEC_CPU_LP64
  454.calculix: -DSPEC_CPU_LP64 -nofor_main
 459.GemsFDTD: -DSPEC_CPU_LP64
     465.tonto: -DSPEC_CPU_LP64
      470.lbm: -DSPEC_CPU_LP64
      481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
   482.sphinx3: -DSPEC_CPU_LP64
```

Base Optimization Flags

C benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

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Base Optimization Flags (Continued)

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

Peak Compiler Invocation

C benchmarks:
```
icc    -m64
```

C++ benchmarks:
```
icpc   -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
    433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
              -ansi-alias

    470.lbm: basepeak = yes

 482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
              -parallel
```

C++ benchmarks:

```
   444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
             -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
             -auto-ilp32
```

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Peak Optimization Flags (Continued)

```
447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
            -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT
```

Fortran benchmarks:

```
410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
            -inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

  465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
             -no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc
             -opt-malloc-options=3 -auto -unroll4
             -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT
```

Benchmarks using both Fortran and C:

```
435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
             -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
             -ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

    481.wrf: basepeak = yes
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.xml

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

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