SPEC® CFP2006 Result
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IBM Corporation

IBM System x3630 M3 (Intel Xeon E5503)

$SPECfp®_rate2006 = $ 77.0
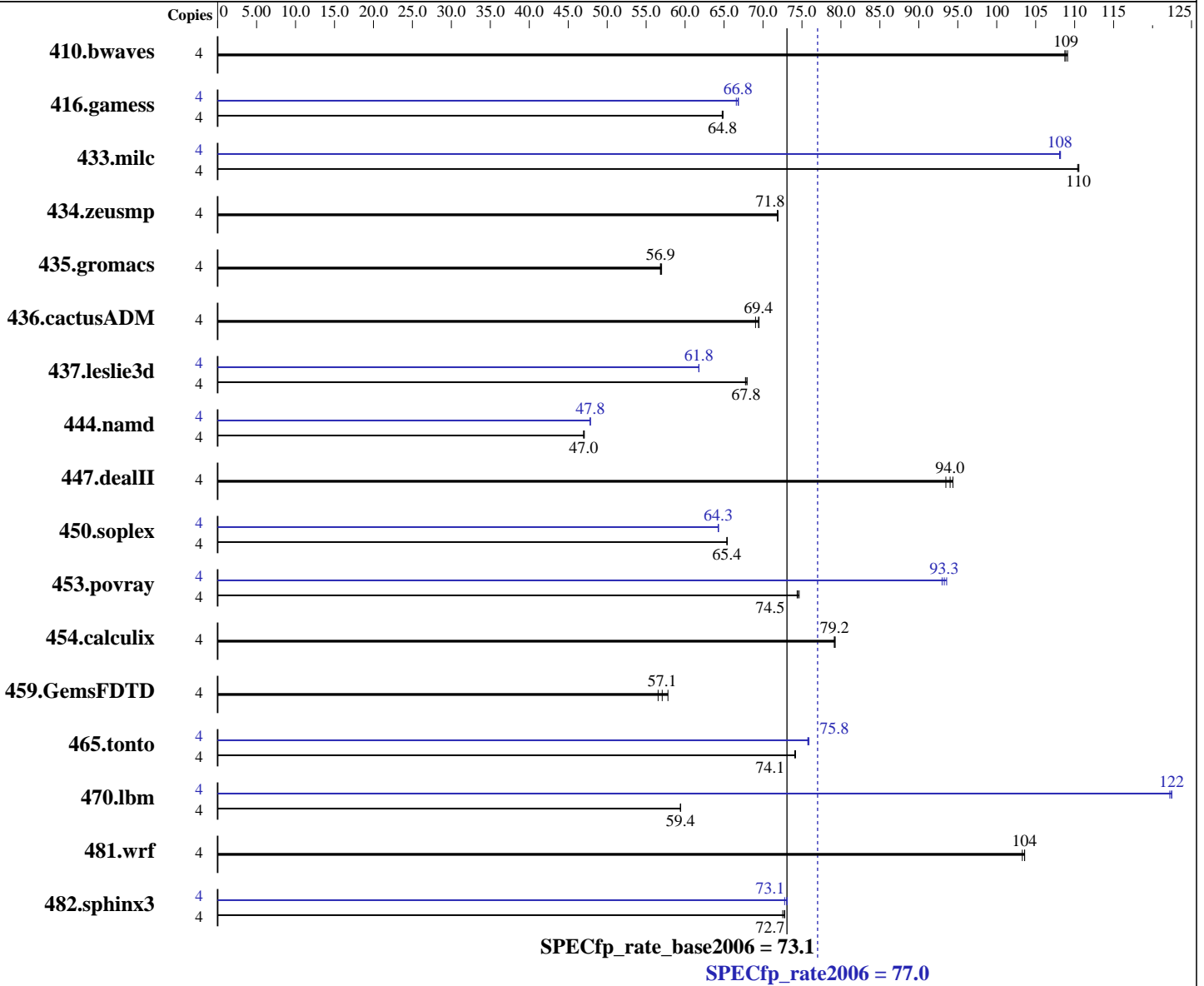
$SPECfp_rate_base2006 = $ 73.1

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

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

Results per benchmark (Copies = 4):

Benchmark	Base	Peak
410.bwaves	109	
416.gamess	64.8	66.8
433.milc	110	108
434.zeusmp	71.8	
435.gromacs	56.9	
436.cactusADM	69.4	
437.leslie3d	67.8	61.8
444.namd	47.0	47.8
447.dealII	94.0	
450.soplex	65.4	64.3
453.povray	74.5	93.3
454.calculix	79.2	
459.GemsFDTD	57.1	
465.tonto	74.1	75.8
470.lbm	59.4	122
481.wrf	104	
482.sphinx3	72.7	73.1

SPECfp_rate_base2006 = 73.1
SPECfp_rate2006 = 77.0

Hardware

CPU Name:	Intel Xeon E5503
CPU Characteristics:	
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	4 cores, 2 chips, 2 cores/chip
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 12.0.1.116 Build 20101116
Auto Parallel:	No
File System:	ext3
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit

Continued on next page

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L3 Cache: 4 MB I+D on chip per chip	Peak Pointers: 32/64-bit
Other Cache: None	Other Software: None
Memory: 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC, running at 800 MHz)	
Disk Subsystem: 1 x 146 GB SAS, 15000 RPM	
Other Hardware: None	

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	498	109	**499**	**109**	500	109	4	498	109	**499**	**109**	500	109
416.gamess	4	1209	64.8	1207	64.9	**1209**	**64.8**	4	**1172**	**66.8**	1176	66.6	1172	66.9
433.milc	4	332	111	**332**	**110**	333	110	4	**340**	**108**	339	108	340	108
434.zeusmp	4	506	71.9	507	71.8	**507**	**71.8**	4	506	71.9	507	71.8	**507**	**71.8**
435.gromacs	4	501	57.0	**502**	**56.9**	503	56.8	4	501	57.0	**502**	**56.9**	503	56.8
436.cactusADM	4	688	69.5	692	69.0	**689**	**69.4**	4	688	69.5	692	69.0	**689**	**69.4**
437.leslie3d	4	555	67.7	553	68.0	**554**	**67.8**	4	**609**	**61.8**	609	61.8	609	61.8
444.namd	4	682	47.1	**683**	**47.0**	683	47.0	4	**671**	**47.8**	671	47.8	671	47.8
447.dealII	4	485	94.4	**487**	**94.0**	490	93.5	4	485	94.4	**487**	**94.0**	490	93.5
450.soplex	4	510	65.4	510	65.4	**510**	**65.4**	4	519	64.3	519	64.3	**519**	**64.3**
453.povray	4	**286**	**74.5**	286	74.4	285	74.6	4	229	93.0	**228**	**93.3**	227	93.6
454.calculix	4	416	79.3	**417**	**79.2**	417	79.2	4	416	79.3	**417**	**79.2**	417	79.2
459.GemsFDTD	4	734	57.8	**744**	**57.1**	751	56.5	4	734	57.8	**744**	**57.1**	751	56.5
465.tonto	4	**531**	**74.1**	531	74.1	531	74.2	4	**519**	**75.8**	519	75.8	519	75.9
470.lbm	4	925	59.4	**925**	**59.4**	925	59.4	4	449	122	**449**	**122**	450	122
481.wrf	4	433	103	431	104	**431**	**104**	4	433	103	431	104	**431**	**104**
482.sphinx3	4	1075	72.5	1071	72.8	**1072**	**72.7**	4	**1067**	**73.1**	1066	73.1	1071	72.8

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.
     numactl was used to bind copies to the cores
```

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 3600 > /proc/sys/vm/nr_hugepages
     export HUGETLB_MORECORE=yes
     export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

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Platform Notes

```
    Power C-State enabled in BIOS
    Data Reuse disabled in BIOS
    Demand Scrub disabled in BIOS
```

General Notes

```
    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
```

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Base Optimization Flags

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

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

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

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

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc    -m64
```

```
482.sphinx3: icc -m32
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```

```
450.soplex: icpc -m32
```

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

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

Peak 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
   453.povray: -DSPEC_CPU_LP64
   454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
     465.tonto: -DSPEC_CPU_LP64
```

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Peak Portability Flags (Continued)

```
   470.lbm: -DSPEC_CPU_LP64
   481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
```

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

   470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
            -ansi-alias -opt-prefetch -static -auto-ilp32

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

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

 447.dealII: basepeak = yes

 450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
             -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
             -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

 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: -xSSE4.2 -ipo -O3 -no-prec-div
              -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes
```

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Peak Optimization Flags (Continued)

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) `-unroll4 -auto`
`-inline-calloc -opt-malloc-options=3`
`-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT`

Benchmarks using both Fortran and C:

435.gromacs: `basepeak = yes`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

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.20110420.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.20110420.xml

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

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