



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®2006 = 31.3

IBM System x3630 M3 (Intel Xeon E5603)

SPECfp_base2006 = 29.8

CPU2006 license: 11

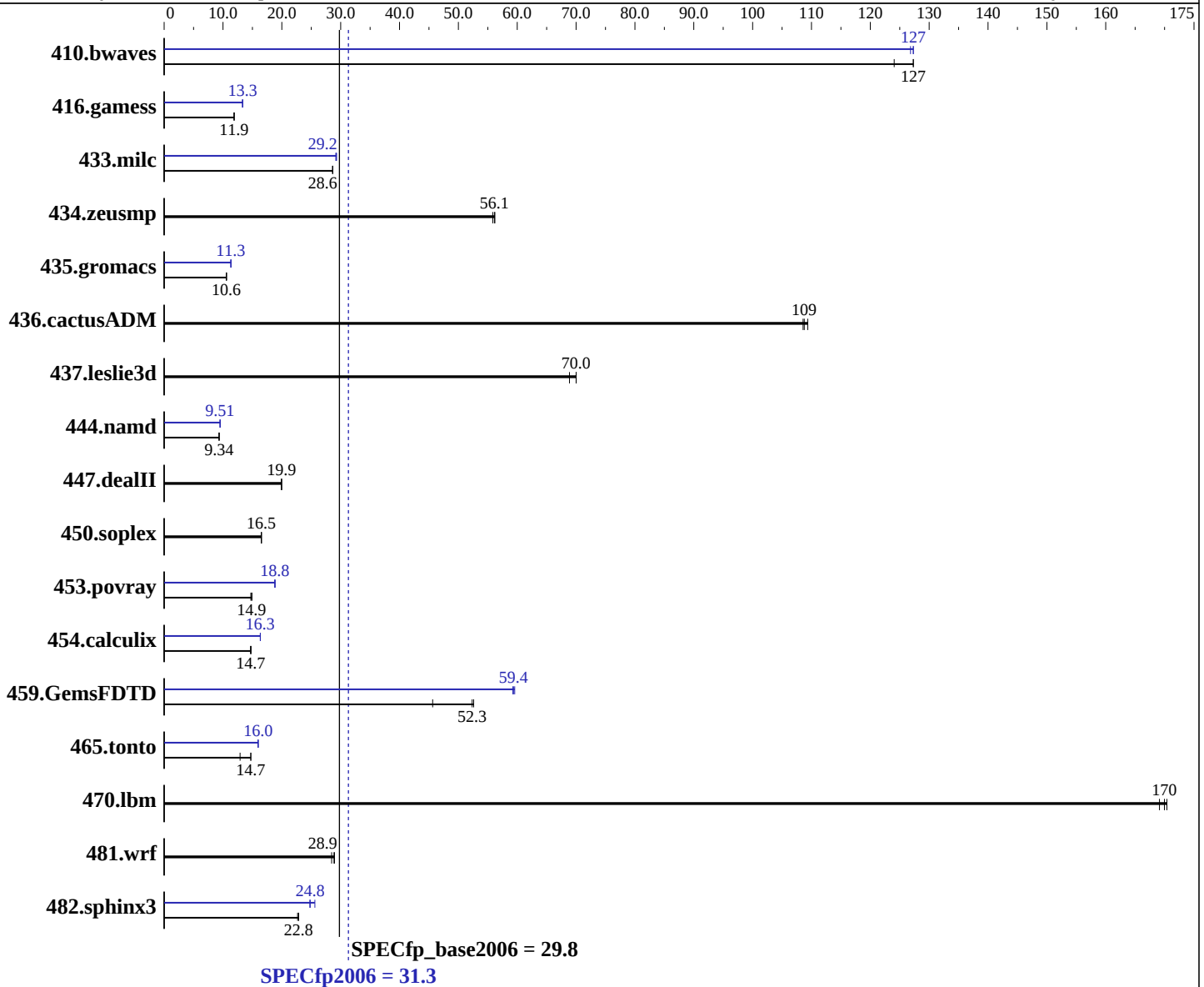
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Apr-2011

Hardware Availability: Feb-2011

Software Availability: Jan-2011



Hardware

CPU Name: Intel Xeon E5603
CPU Characteristics:
CPU MHz: 1600
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 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

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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: 4 MB I+D on chip per chip
Other Cache: None
Memory: 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC, running at 1067 MHz)
Disk Subsystem: 1 x 146 GB SAS, 15000 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	110	124	<u>107</u>	<u>127</u>	107	127	<u>107</u>	<u>127</u>	107	127	<u>107</u>	<u>127</u>
416.gamess	1646	11.9	1647	11.9	<u>1646</u>	<u>11.9</u>	1471	13.3	1467	13.4	<u>1468</u>	<u>13.3</u>
433.milc	<u>321</u>	<u>28.6</u>	320	28.6	321	28.6	<u>313</u>	<u>29.3</u>	<u>314</u>	<u>29.2</u>	314	29.2
434.zeusmp	<u>162</u>	<u>56.1</u>	162	56.2	163	55.9	<u>162</u>	<u>56.1</u>	162	56.2	163	55.9
435.gromacs	<u>674</u>	<u>10.6</u>	677	10.6	673	10.6	<u>629</u>	<u>11.3</u>	<u>629</u>	<u>11.3</u>	629	11.3
436.cactusADM	109	109	110	109	<u>110</u>	<u>109</u>	109	109	110	109	<u>110</u>	<u>109</u>
437.leslie3d	136	68.9	134	70.0	<u>134</u>	<u>70.0</u>	136	68.9	134	70.0	<u>134</u>	<u>70.0</u>
444.namd	860	9.33	858	9.35	<u>858</u>	<u>9.34</u>	843	9.52	844	9.50	<u>844</u>	<u>9.51</u>
447.dealII	<u>573</u>	<u>19.9</u>	574	19.9	573	20.0	<u>573</u>	<u>19.9</u>	574	19.9	573	20.0
450.soplex	504	16.5	<u>505</u>	<u>16.5</u>	505	16.5	504	16.5	<u>505</u>	<u>16.5</u>	505	16.5
453.povray	357	14.9	361	14.7	<u>358</u>	<u>14.9</u>	<u>283</u>	<u>18.8</u>	282	18.9	283	18.8
454.calculix	562	14.7	559	14.7	<u>560</u>	<u>14.7</u>	505	16.4	<u>505</u>	<u>16.3</u>	505	16.3
459.GemsFDTD	<u>203</u>	<u>52.3</u>	202	52.6	233	45.6	<u>179</u>	<u>59.4</u>	179	59.2	178	59.6
465.tonto	763	12.9	668	14.7	<u>668</u>	<u>14.7</u>	617	15.9	<u>616</u>	<u>16.0</u>	615	16.0
470.lbm	81.2	169	<u>80.8</u>	<u>170</u>	80.6	170	81.2	169	<u>80.8</u>	<u>170</u>	80.6	170
481.wrf	<u>387</u>	<u>28.9</u>	386	29.0	392	28.5	<u>387</u>	<u>28.9</u>	386	29.0	392	28.5
482.sphinx3	<u>853</u>	<u>22.8</u>	852	22.9	859	22.7	<u>785</u>	<u>24.8</u>	761	25.6	<u>787</u>	<u>24.8</u>

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

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



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General Notes

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

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.dealIII: 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: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -parallel
-static

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: -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 -opt-prefetch -parallel
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

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.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>

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