



SPEC® CFP2006 Result

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NEC Corporation

Express5800/GT120a
(Intel Xeon E5502)

SPECfp®2006 = 23.1

SPECfp_base2006 = 21.8

CPU2006 license: 9006

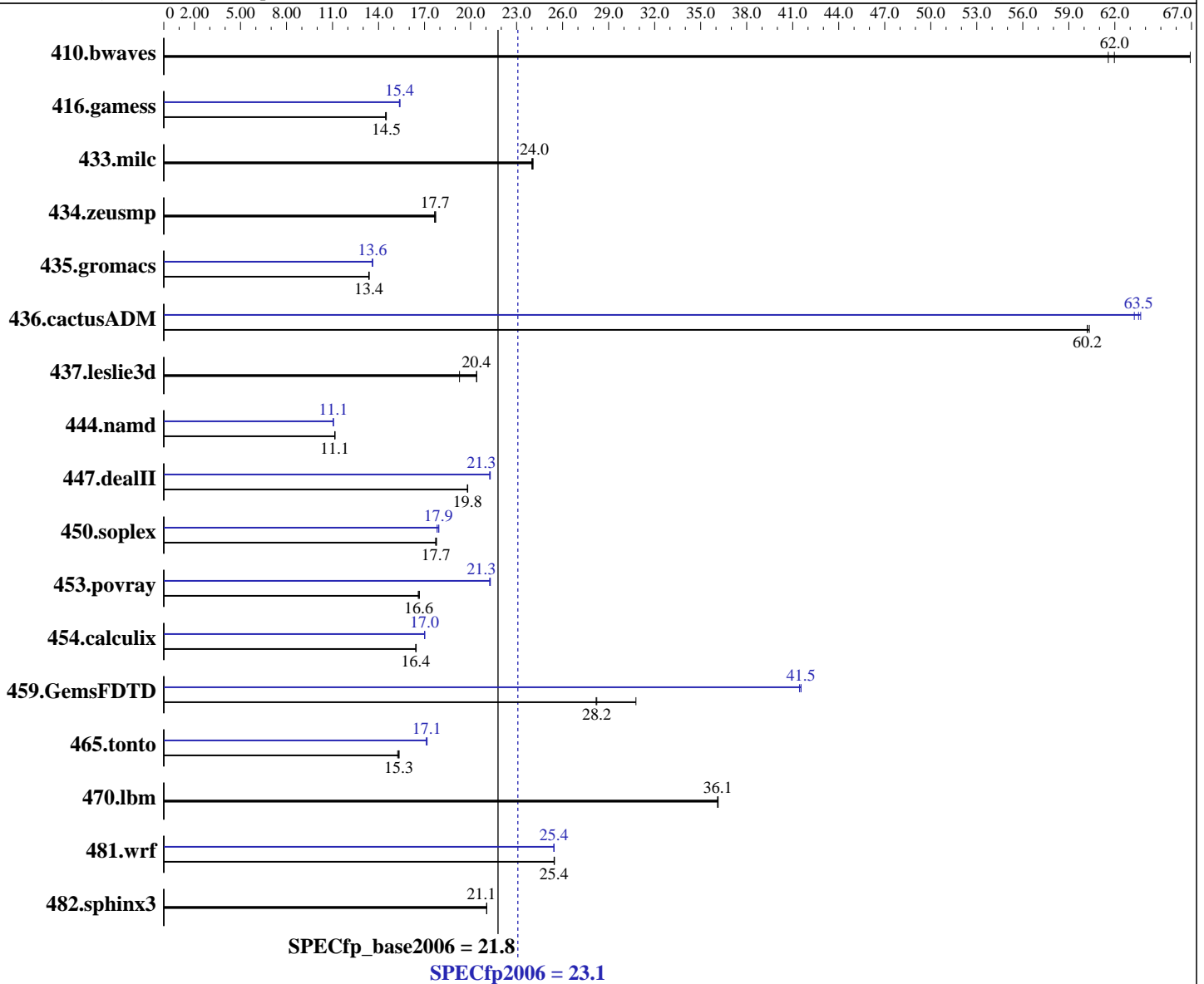
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Jun-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009



Hardware

CPU Name: Intel Xeon E5502
 CPU Characteristics:
 CPU MHz: 1867
 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

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Software

Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP2 with patch Linux kernel 20090119, Kernel 2.6.16.60-0.34-smp
 Compiler: Intel C++ and Fortran Compiler 11.0 for Linux Build 20090131 Package ID: l_cproc_p_11.0.081, l_cprof_p_11.0.081
 Auto Parallel: Yes
 File System: ReiserFS
 System State: Run level 3 (multi-user)

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L3 Cache: 4 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (12 X 4 GB PC3-8500R running at 800 MHz)
Disk Subsystem: 1x160 GB SATA2, 7200 RPM
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: Binutils 2.18.50.0.7.20080502

Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 203 | 66.9 | 221 | 61.6 | <u>219</u> | <u>62.0</u> | 203 | 66.9 | 221 | 61.6 | <u>219</u> | <u>62.0</u> |
| 416.gamess | 1355 | 14.5 | <u>1350</u> | <u>14.5</u> | 1350 | 14.5 | <u>1273</u> | <u>15.4</u> | 1275 | 15.4 | 1272 | 15.4 |
| 433.milc | <u>382</u> | <u>24.0</u> | 381 | 24.1 | 383 | 24.0 | <u>382</u> | <u>24.0</u> | 381 | 24.1 | 383 | 24.0 |
| 434.zeusmp | 513 | 17.7 | <u>514</u> | <u>17.7</u> | 516 | 17.7 | 513 | 17.7 | <u>514</u> | <u>17.7</u> | 516 | 17.7 |
| 435.gromacs | <u>534</u> | <u>13.4</u> | 534 | 13.4 | 533 | 13.4 | 524 | 13.6 | <u>525</u> | <u>13.6</u> | 525 | 13.6 |
| 436.cactusADM | <u>198</u> | <u>60.2</u> | 198 | 60.3 | 198 | 60.2 | 189 | 63.3 | <u>188</u> | <u>63.5</u> | 188 | 63.7 |
| 437.leslie3d | 488 | 19.3 | <u>461</u> | <u>20.4</u> | 461 | 20.4 | 488 | 19.3 | <u>461</u> | <u>20.4</u> | 461 | 20.4 |
| 444.namd | <u>719</u> | <u>11.1</u> | 719 | 11.1 | 719 | 11.2 | 725 | 11.1 | 726 | 11.1 | <u>726</u> | <u>11.1</u> |
| 447.dealII | 577 | 19.8 | 578 | 19.8 | <u>578</u> | <u>19.8</u> | <u>538</u> | <u>21.3</u> | 537 | 21.3 | 538 | 21.2 |
| 450.soplex | <u>470</u> | <u>17.7</u> | 469 | 17.8 | 471 | 17.7 | <u>466</u> | <u>17.9</u> | 468 | 17.8 | 465 | 17.9 |
| 453.povray | <u>320</u> | <u>16.6</u> | 321 | 16.6 | 319 | 16.7 | <u>250</u> | <u>21.3</u> | 250 | 21.3 | 250 | 21.2 |
| 454.calculix | 502 | 16.4 | 501 | 16.5 | <u>502</u> | <u>16.4</u> | 485 | 17.0 | 485 | 17.0 | <u>485</u> | <u>17.0</u> |
| 459.GemsFDTD | <u>376</u> | <u>28.2</u> | 376 | 28.2 | 345 | 30.8 | 256 | 41.4 | 255 | 41.5 | <u>255</u> | <u>41.5</u> |
| 465.tonto | <u>642</u> | <u>15.3</u> | 641 | 15.3 | 645 | 15.2 | 573 | 17.2 | <u>574</u> | <u>17.1</u> | 575 | 17.1 |
| 470.lbm | 380 | 36.1 | 381 | 36.1 | <u>380</u> | <u>36.1</u> | 380 | 36.1 | 381 | 36.1 | <u>380</u> | <u>36.1</u> |
| 481.wrf | 439 | 25.4 | <u>439</u> | <u>25.4</u> | 439 | 25.5 | <u>439</u> | <u>25.4</u> | 439 | 25.4 | 439 | 25.4 |
| 482.sphinx3 | 926 | 21.0 | <u>926</u> | <u>21.1</u> | 925 | 21.1 | 926 | 21.0 | <u>926</u> | <u>21.1</u> | 925 | 21.1 |

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
OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to granularity=fine,scatter
KMP_STACKSIZE set to 200M

Platform Notes

BIOS setting:
NUMA configuration : Enabled



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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icc ifort

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

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

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



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Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks (except as noted below):

icpc

450.soplex: icpc -m32

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icc ifort

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
 470.lbm: -DSPEC_CPU_LP64
 481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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Peak Optimization Flags (Continued)

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

447.dealII: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
-unroll2 -ansi-alias -scalar-rep- -opt-prefetch

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
-opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
-unroll4 -ansi-alias

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) -static(pass 2) -prof-use(pass 2)
-unroll2 -Ob0 -ansi-alias -scalar-rep-

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) -static(pass 2) -prof-use(pass 2)
-unroll2 -Ob0 -opt-prefetch -parallel

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
-unroll4 -auto

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) -static(pass 2) -prof-use(pass 2)
-opt-prefetch -auto-ilp32

436.cactusADM: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
-unroll2 -opt-prefetch -parallel -auto-ilp32

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

481.wrf: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch
-parallel -auto-ilp32



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The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.html>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.xml>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.xml>

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Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 01:27:49 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 23 June 2009.