



SPEC[®] CFP2006 Result

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NEC Corporation

SPECfp[®]2006 = **112**

Express5800/R120g-1E (Intel Xeon E5-2650 v4)

SPECfp_base2006 = **107**

CPU2006 license: 9006

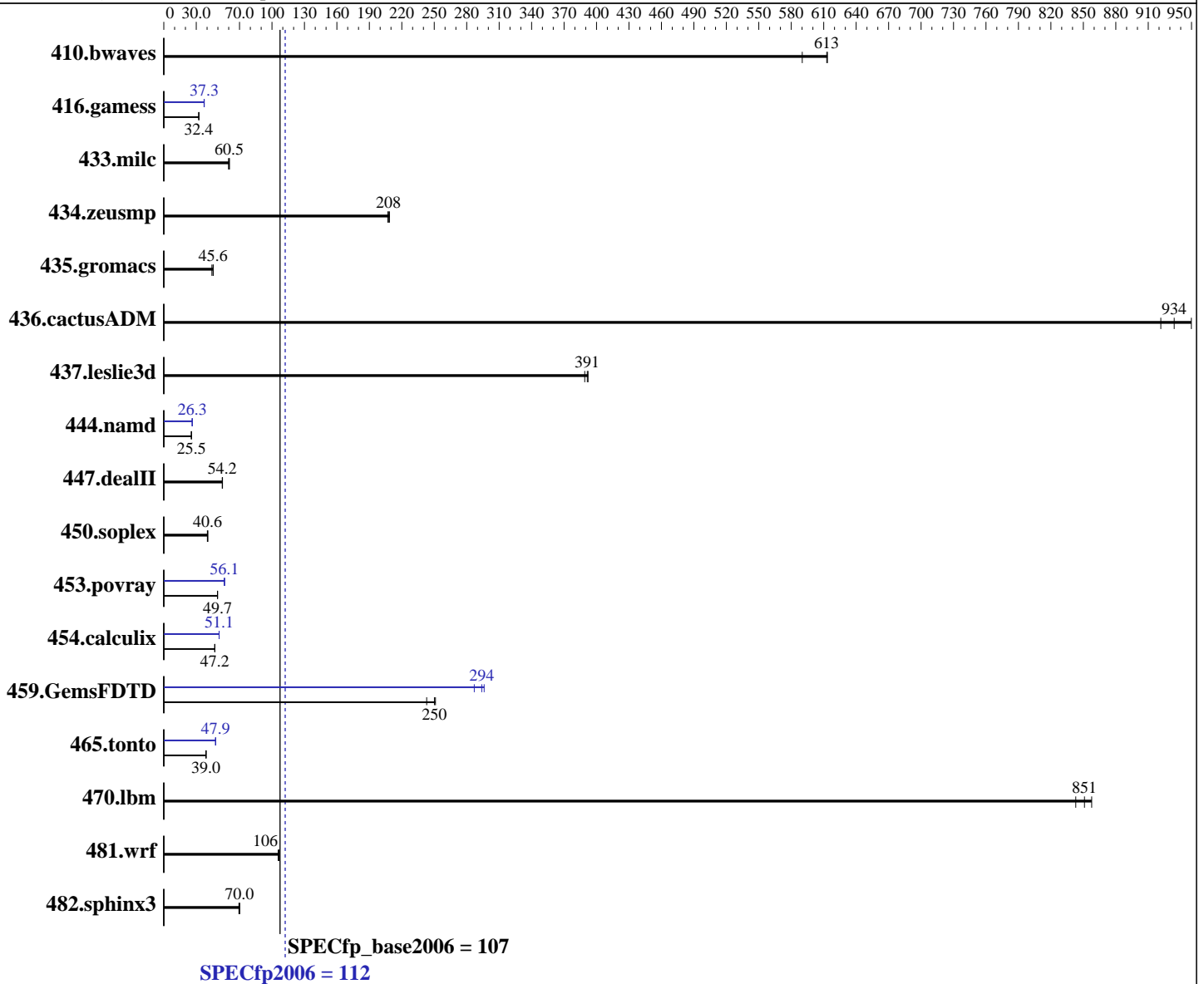
Test date: Apr-2016

Test sponsor: NEC Corporation

Hardware Availability: Jun-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



Hardware

CPU Name: Intel Xeon E5-2650 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
 CPU MHz: 2200
 FPU: Integrated
 CPU(s) enabled: 24 cores, 2 chips, 12 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: Red Hat Enterprise Linux Server release 7.2 (Maipo)
 Kernel 3.10.0-327.4.5.el7.x86_64
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
 Auto Parallel: Yes
 File System: ext4

Continued on next page



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L3 Cache: 30 MB I+D on chip per chip
 Other Cache: None
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
 Disk Subsystem: 1 x 1 TB SATA, 7200 RPM
 Other Hardware: None

System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 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 | 22.2 | 613 | <u>22.2</u> | <u>613</u> | 23.0 | 590 | 22.2 | 613 | <u>22.2</u> | <u>613</u> | 23.0 | 590 |
| 416.gamess | <u>605</u> | <u>32.4</u> | 604 | 32.4 | 605 | 32.3 | 526 | 37.2 | <u>524</u> | <u>37.3</u> | 524 | 37.4 |
| 433.milc | <u>152</u> | <u>60.5</u> | 151 | 60.6 | 154 | 59.8 | <u>152</u> | <u>60.5</u> | 151 | 60.6 | 154 | 59.8 |
| 434.zeusmp | 43.6 | 209 | 44.0 | 207 | <u>43.8</u> | <u>208</u> | 43.6 | 209 | 44.0 | 207 | <u>43.8</u> | <u>208</u> |
| 435.gromacs | 161 | 44.5 | 156 | 45.7 | <u>157</u> | <u>45.6</u> | 161 | 44.5 | 156 | 45.7 | <u>157</u> | <u>45.6</u> |
| 436.cactusADM | 12.6 | 950 | <u>12.8</u> | <u>934</u> | 13.0 | 922 | 12.6 | 950 | <u>12.8</u> | <u>934</u> | 13.0 | 922 |
| 437.leslie3d | 24.2 | 389 | <u>24.0</u> | <u>391</u> | 24.0 | 392 | 24.2 | 389 | <u>24.0</u> | <u>391</u> | 24.0 | 392 |
| 444.namd | 314 | 25.5 | 314 | 25.5 | <u>314</u> | <u>25.5</u> | <u>305</u> | <u>26.3</u> | 305 | 26.3 | 305 | 26.3 |
| 447.dealII | 211 | 54.3 | 212 | 54.0 | <u>211</u> | <u>54.2</u> | 211 | 54.3 | 212 | 54.0 | <u>211</u> | <u>54.2</u> |
| 450.soplex | 205 | 40.6 | <u>205</u> | <u>40.6</u> | 207 | 40.3 | 205 | 40.6 | <u>205</u> | <u>40.6</u> | 207 | 40.3 |
| 453.povray | 107 | 49.6 | <u>107</u> | <u>49.7</u> | 107 | 49.7 | 94.7 | 56.2 | 95.2 | 55.9 | <u>94.8</u> | <u>56.1</u> |
| 454.calculix | 175 | 47.1 | <u>175</u> | <u>47.2</u> | 175 | 47.2 | 161 | 51.2 | <u>161</u> | <u>51.1</u> | 161 | 51.1 |
| 459.GemsFDTD | 42.2 | 251 | 43.7 | 243 | <u>42.4</u> | <u>250</u> | 37.0 | 287 | <u>36.1</u> | <u>294</u> | 35.8 | 296 |
| 465.tonto | 252 | 39.1 | 252 | 39.0 | <u>252</u> | <u>39.0</u> | 206 | 47.8 | 205 | 48.0 | <u>206</u> | <u>47.9</u> |
| 470.lbm | <u>16.1</u> | <u>851</u> | 16.0 | 858 | 16.3 | 843 | <u>16.1</u> | <u>851</u> | 16.0 | 858 | 16.3 | 843 |
| 481.wrf | <u>105</u> | <u>106</u> | 106 | 106 | 105 | 106 | <u>105</u> | <u>106</u> | 106 | 106 | 105 | 106 |
| 482.sphinx3 | 278 | 70.1 | 281 | 69.4 | <u>278</u> | <u>70.0</u> | 278 | 70.1 | 281 | 69.4 | <u>278</u> | <u>70.0</u> |

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

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS Settings:
 Power Management Policy: Custom
 Energy Performance: Performance
 Patrol Scrub: Disabled
 Snoop Mode: Home Snoop
 Hyper-Threading: Disabled



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General Notes

Environment variables set by runspec before the start of the run:

KMP_AFFINITY = "granularity=fine,compact"

LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

OMP_NUM_THREADS = "24"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent_hugepage/enabled

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:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -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: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

Continued on next page

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Page 4



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Peak Optimization Flags (Continued)

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes



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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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120g-RevC.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120g-RevC.xml>

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Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jun 30 14:05:51 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 14 June 2016.