



SPEC® CFP2006 Result

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NEC Corporation

SPECfp®2006 = 125

Express5800/R120g-2M (Intel Xeon E5-2697 v4)

SPECfp_base2006 = 118

CPU2006 license: 9006

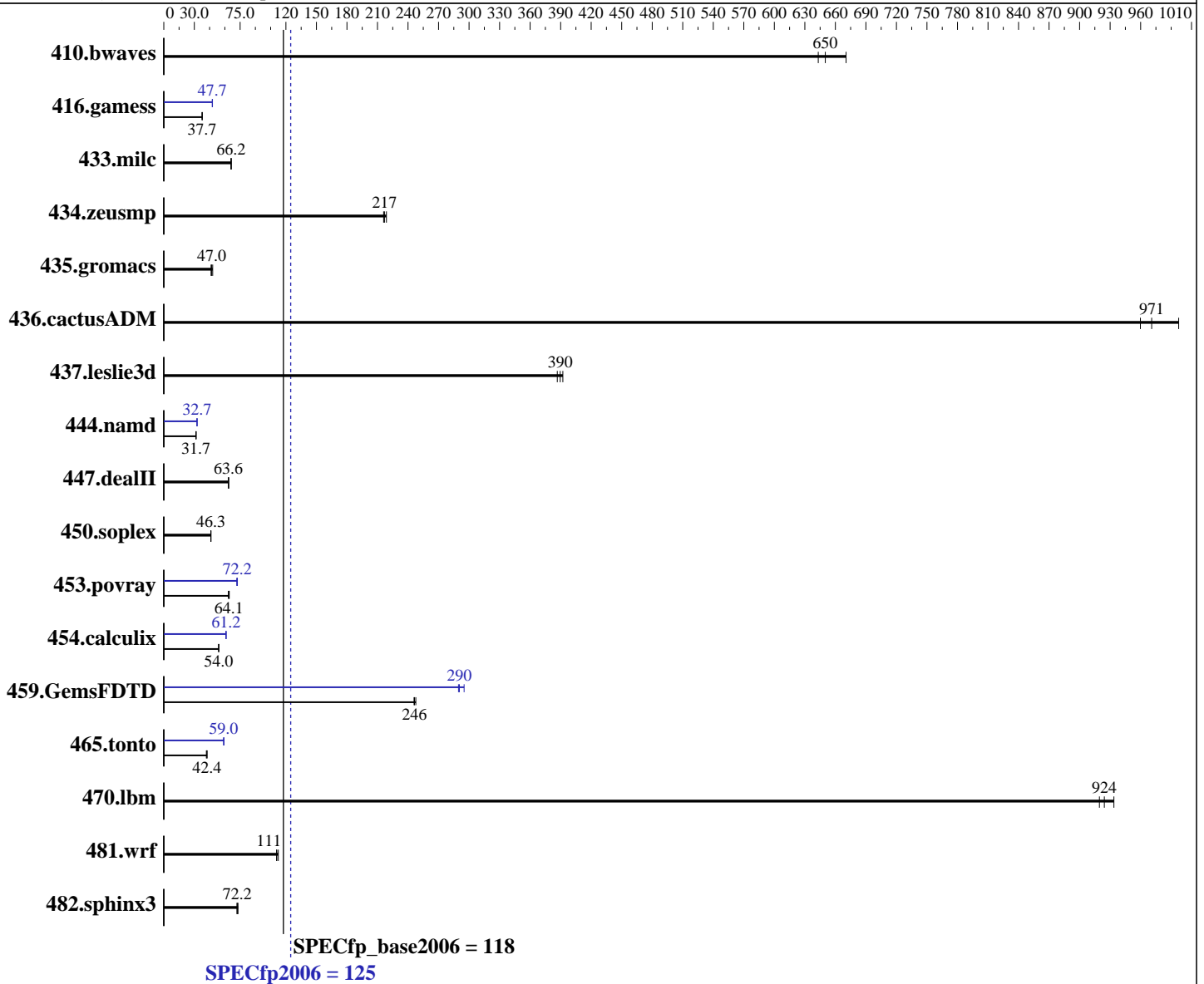
Test date: Mar-2016

Test sponsor: NEC Corporation

Hardware Availability: Apr-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



Hardware

CPU Name: Intel Xeon E5-2697 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
 CPU MHz: 2300
 FPU: Integrated
 CPU(s) enabled: 36 cores, 2 chips, 18 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: 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

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L3 Cache: 45 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 | 21.1 | 643 | 20.3 | 671 | <u>20.9</u> | <u>650</u> | 21.1 | 643 | 20.3 | 671 | <u>20.9</u> | <u>650</u> |
| 416.gamess | 519 | 37.7 | 519 | 37.8 | <u>519</u> | <u>37.7</u> | 411 | 47.6 | 409 | 47.8 | <u>410</u> | <u>47.7</u> |
| 433.milc | 139 | 66.1 | <u>139</u> | <u>66.2</u> | 138 | 66.3 | 139 | 66.1 | <u>139</u> | <u>66.2</u> | 138 | 66.3 |
| 434.zeusmp | 41.6 | 219 | 42.1 | 216 | <u>42.0</u> | <u>217</u> | 41.6 | 219 | 42.1 | 216 | <u>42.0</u> | <u>217</u> |
| 435.gromacs | <u>152</u> | <u>47.0</u> | 149 | 48.1 | 154 | 46.4 | <u>152</u> | <u>47.0</u> | 149 | 48.1 | 154 | 46.4 |
| 436.cactusADM | 12.5 | 960 | <u>12.3</u> | <u>971</u> | 12.0 | 997 | 12.5 | 960 | <u>12.3</u> | <u>971</u> | 12.0 | 997 |
| 437.leslie3d | 24.0 | 392 | <u>24.1</u> | <u>390</u> | 24.3 | 387 | 24.0 | 392 | <u>24.1</u> | <u>390</u> | 24.3 | 387 |
| 444.namd | 253 | 31.7 | 253 | 31.6 | <u>253</u> | <u>31.7</u> | 246 | 32.7 | <u>246</u> | <u>32.7</u> | 246 | 32.7 |
| 447.dealII | 180 | 63.5 | 179 | 63.8 | <u>180</u> | <u>63.6</u> | 180 | 63.5 | 179 | 63.8 | <u>180</u> | <u>63.6</u> |
| 450.soplex | 180 | 46.4 | <u>180</u> | <u>46.3</u> | 181 | 46.2 | 180 | 46.4 | <u>180</u> | <u>46.3</u> | 181 | 46.2 |
| 453.povray | 83.9 | 63.4 | 82.7 | 64.3 | <u>83.0</u> | <u>64.1</u> | 73.5 | 72.3 | 74.2 | 71.7 | <u>73.7</u> | <u>72.2</u> |
| 454.calculix | 153 | 54.0 | <u>153</u> | <u>54.0</u> | 153 | 53.9 | <u>135</u> | <u>61.2</u> | 135 | 61.2 | 135 | 61.2 |
| 459.GemsFDTD | <u>43.1</u> | <u>246</u> | 43.1 | 246 | 42.8 | 248 | 35.9 | 295 | <u>36.5</u> | <u>290</u> | 36.6 | 290 |
| 465.tonto | 232 | 42.5 | 235 | 41.8 | <u>232</u> | <u>42.4</u> | 166 | 59.1 | <u>167</u> | <u>59.0</u> | 167 | 58.8 |
| 470.lbm | 14.9 | 919 | 14.7 | 934 | <u>14.9</u> | <u>924</u> | 14.9 | 919 | 14.7 | 934 | <u>14.9</u> | <u>924</u> |
| 481.wrf | 101 | 111 | <u>101</u> | <u>111</u> | 99.3 | 113 | 101 | 111 | <u>101</u> | <u>111</u> | 99.3 | 113 |
| 482.sphinx3 | <u>270</u> | <u>72.2</u> | 267 | 72.9 | 271 | 71.9 | <u>270</u> | <u>72.2</u> | 267 | 72.9 | 271 | 71.9 |

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 = "36"

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

The Express5800/R120g-1M (Intel Xeon E5-2697 v4) and the Express5800/R120g-2M (Intel Xeon E5-2697 v4) models are electronically equivalent. The results have been measured on the Express5800/R120g-2M (Intel Xeon E5-2697 v4) model.

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.lelie3d: -DSPEC_CPU_LP64
 444.namd: -DSPEC_CPU_LP64
 447.deallI: -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

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Base Portability Flags (Continued)

482.sphinx3: -DSPEC_CPU_LP64

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

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Peak Optimization Flags (Continued)

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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

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Peak Optimization Flags (Continued)

454.calculix: -xCORE-AVX2 -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-ic16.0-official-linux64.html>

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

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jun 30 13:13:26 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 19 April 2016.