



SPEC[®] CFP2006 Result

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NEC Corporation

SPECfp[®]_rate2006 = 374

Express5800/B120g-h (Intel Xeon E5-2667 v4)

SPECfp_rate_base2006 = 366

CPU2006 license: 9006

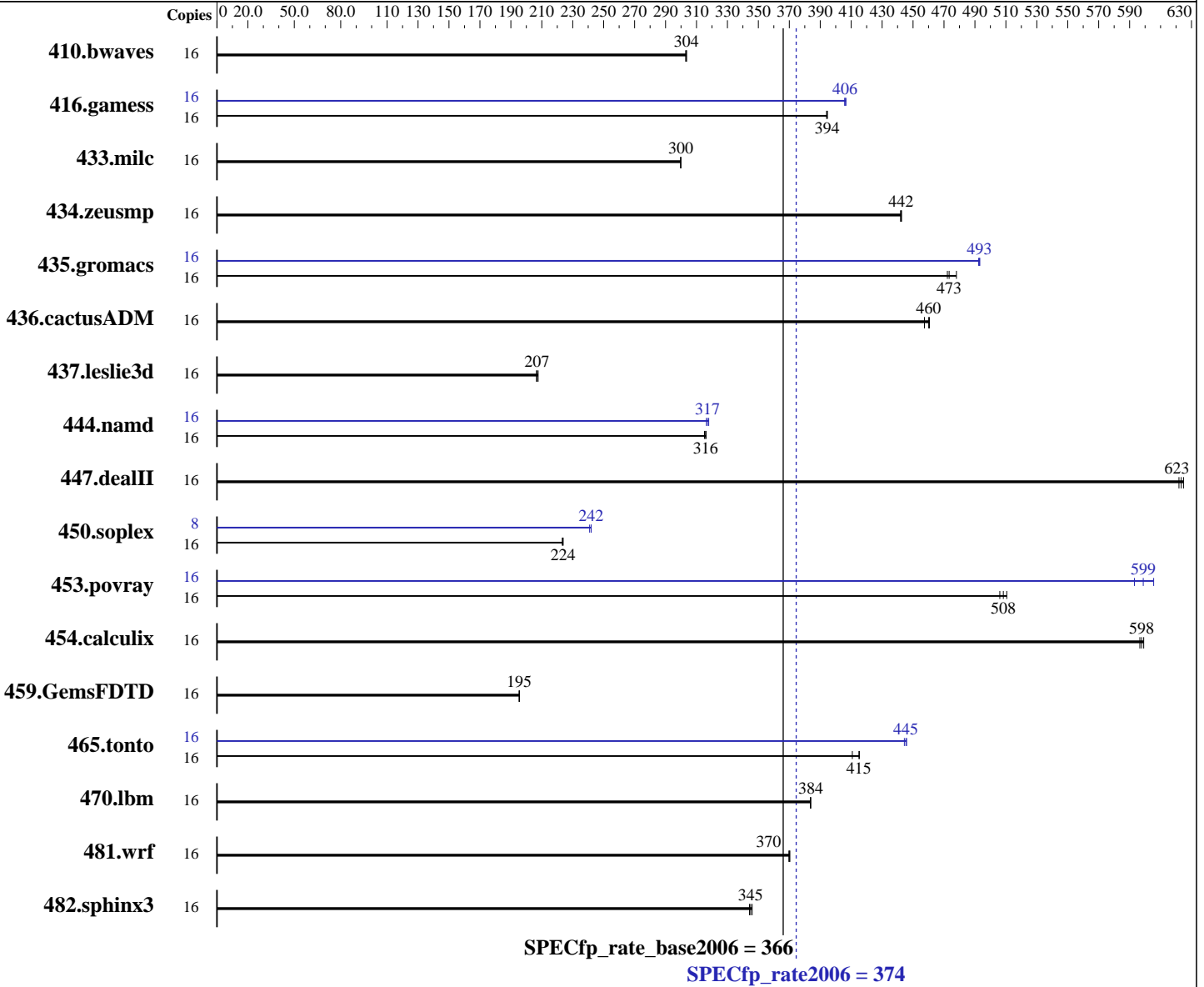
Test date: Mar-2016

Test sponsor: NEC Corporation

Hardware Availability: Dec-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



Hardware

CPU Name: Intel Xeon E5-2667 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
 CPU MHz: 3200
 FPU: Integrated
 CPU(s) enabled: 8 cores, 1 chip, 8 cores/chip, 2 threads/core
 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: No
 File System: ext4

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L3 Cache: 25 MB I+D on chip per chip
 Other Cache: None
 Memory: 64 GB (4 x 16 GB 2Rx4 PC4-2400T-R)
 Disk Subsystem: NEC Storage M310 via Fibre Channel
 (See additional details below)
 Other Hardware: None

System State: Run level 3 (multi-user)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit
 Other Software: None

Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---------------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 16 | 718 | 303 | 716 | 304 | <u>716</u> | <u>304</u> | 16 | 718 | 303 | 716 | 304 | <u>716</u> | <u>304</u> |
| 416.gamess | 16 | 794 | 395 | 795 | 394 | <u>794</u> | <u>394</u> | 16 | 770 | 407 | 772 | 406 | <u>771</u> | <u>406</u> |
| 433.milc | 16 | 490 | 300 | <u>490</u> | <u>300</u> | 490 | 300 | 16 | 490 | 300 | <u>490</u> | <u>300</u> | 490 | 300 |
| 434.zeusmp | 16 | <u>329</u> | <u>442</u> | 329 | 442 | 329 | 443 | 16 | <u>329</u> | <u>442</u> | 329 | 442 | 329 | 443 |
| 435.gromacs | 16 | 239 | 478 | 242 | 472 | <u>241</u> | <u>473</u> | 16 | <u>232</u> | <u>493</u> | 232 | 492 | 232 | 493 |
| 436.cactusADM | 16 | 415 | 461 | 418 | 457 | <u>416</u> | <u>460</u> | 16 | 415 | 461 | 418 | 457 | <u>416</u> | <u>460</u> |
| 437.leslie3d | 16 | <u>727</u> | <u>207</u> | 728 | 207 | 724 | 208 | 16 | <u>727</u> | <u>207</u> | 728 | 207 | 724 | 208 |
| 444.namd | 16 | 407 | 315 | 406 | 316 | <u>406</u> | <u>316</u> | 16 | 404 | 318 | 406 | 316 | <u>405</u> | <u>317</u> |
| 447.dealII | 16 | 293 | 625 | 294 | 622 | <u>294</u> | <u>623</u> | 16 | 293 | 625 | 294 | 622 | <u>294</u> | <u>623</u> |
| 450.soplex | 16 | 596 | 224 | <u>596</u> | <u>224</u> | 598 | 223 | 8 | <u>276</u> | <u>242</u> | 276 | 242 | 277 | 241 |
| 453.povray | 16 | 167 | 511 | <u>167</u> | <u>508</u> | 168 | 506 | 16 | <u>142</u> | <u>599</u> | 144 | 593 | 141 | 606 |
| 454.calculix | 16 | 221 | 597 | <u>221</u> | <u>598</u> | 220 | 599 | 16 | 221 | 597 | <u>221</u> | <u>598</u> | 220 | 599 |
| 459.GemsFDTD | 16 | <u>869</u> | <u>195</u> | 869 | 195 | 868 | 196 | 16 | <u>869</u> | <u>195</u> | 869 | 195 | 868 | 196 |
| 465.tonto | 16 | <u>379</u> | <u>415</u> | 383 | 411 | 379 | 415 | 16 | 354 | 444 | 353 | 446 | <u>354</u> | <u>445</u> |
| 470.lbm | 16 | 573 | 384 | 573 | 384 | <u>573</u> | <u>384</u> | 16 | 573 | 384 | 573 | 384 | <u>573</u> | <u>384</u> |
| 481.wrf | 16 | <u>483</u> | <u>370</u> | 483 | 370 | 483 | 370 | 16 | <u>483</u> | <u>370</u> | 483 | 370 | 483 | 370 |
| 482.sphinx3 | 16 | 906 | 344 | <u>904</u> | <u>345</u> | 901 | 346 | 16 | 906 | 344 | <u>904</u> | <u>345</u> | 901 | 346 |

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

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



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Platform Notes

BIOS Settings:

Energy Performance: Performance
Patrol Scrub: Disabled

Storage Configuration for Disk Subsystem:

NEC Storage M310 has 4 x 600 GB 10000 RPM SAS disks under RAID-10 configuration mounted over 8Gbps Fibre Channel interface with these options "defaults" in the /etc/fstab.

General Notes

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

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

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

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Base Portability Flags (Continued)

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:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
 -ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
 -ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
 -ansi-alias -opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64

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Peak Portability Flags (Continued)

```

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: -D_FILE_OFFSET_BITS=64
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:

```

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) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -fno-alias -auto-ilp32

```

447.dealII: basepeak = yes

```

450.soplex: -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) -opt-mem-layout-trans=3(pass 2)
          -prof-use(pass 2) -opt-malloc-options=3

```

```

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) -opt-mem-layout-trans=3(pass 2)
          -prof-use(pass 2) -unroll4 -ansi-alias

```

Fortran benchmarks:

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Peak Optimization Flags (Continued)

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: basepeak = yes

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) -unroll4 -auto
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -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) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -opt-prefetch -auto-ilp32

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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-B120g-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-B120g-RevB.xml>



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