



# SPEC® CFP2006 Result

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NEC Corporation

SPECfp®\_rate2006 = 288

Express5800/R120f-2M (Intel Xeon E5-2603 v3)

SPECfp\_rate\_base2006 = 281

CPU2006 license: 9006

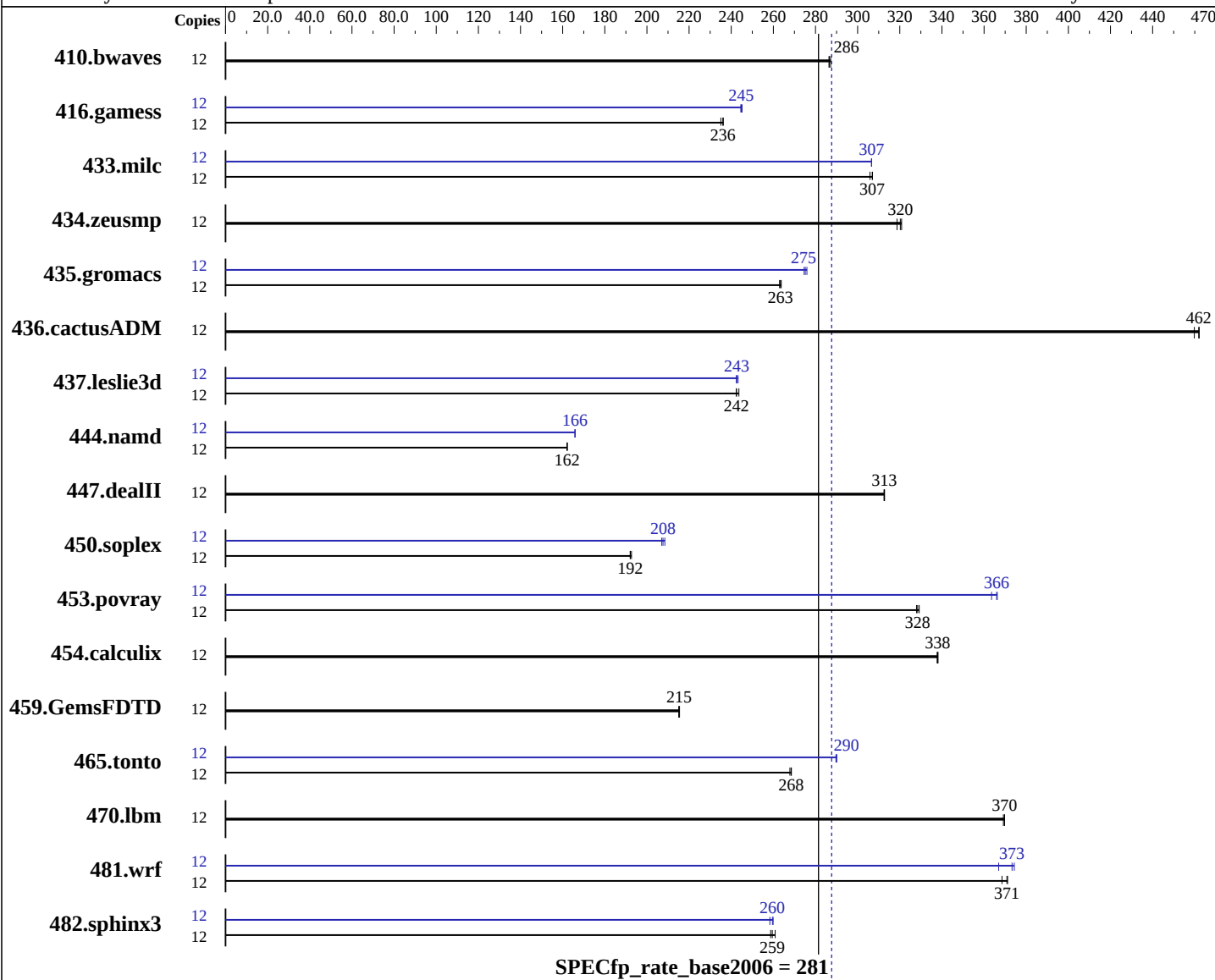
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Feb-2015

Hardware Availability: Feb-2015

Software Availability: Jul-2014



## Hardware

CPU Name: Intel Xeon E5-2603 v3  
CPU Characteristics:  
CPU MHz: 1600  
FPU: Integrated  
CPU(s) enabled: 12 cores, 2 chips, 6 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 6.5 (Santiago)  
Kernel 2.6.32-431.17.1.el6.x86\_64  
Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;  
Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux  
Auto Parallel: No  
File System: ext4

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L3 Cache: 15 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
 Disk Subsystem: 1 x 250 GB SATA, 7200 RPM  
 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    | 12     | 568        | 287        | <b>569</b> | <b>286</b> | 569        | 286        | 12     | 568        | 287        | <b>569</b> | <b>286</b> | 569        | 286        |
| 416.gamess    | 12     | <b>996</b> | <b>236</b> | 999        | 235        | 995        | 236        | 12     | 958        | 245        | 961        | 245        | <b>960</b> | <b>245</b> |
| 433.milc      | 12     | 359        | 307        | 360        | 306        | <b>359</b> | <b>307</b> | 12     | 359        | 307        | 359        | 307        | <b>359</b> | <b>307</b> |
| 434.zeusmp    | 12     | 340        | 321        | <b>341</b> | <b>320</b> | 343        | 319        | 12     | 340        | 321        | <b>341</b> | <b>320</b> | 343        | 319        |
| 435.gromacs   | 12     | 325        | 264        | <b>325</b> | <b>263</b> | 326        | 263        | 12     | <b>311</b> | <b>275</b> | 312        | 275        | 311        | 276        |
| 436.cactusADM | 12     | 310        | 462        | 312        | 460        | <b>310</b> | <b>462</b> | 12     | 310        | 462        | 312        | 460        | <b>310</b> | <b>462</b> |
| 437.leslie3d  | 12     | 463        | 244        | 465        | 242        | <b>465</b> | <b>242</b> | 12     | 464        | 243        | <b>465</b> | <b>243</b> | 465        | 242        |
| 444.namd      | 12     | 594        | 162        | 593        | 162        | <b>594</b> | <b>162</b> | 12     | 580        | 166        | <b>580</b> | <b>166</b> | 580        | 166        |
| 447.dealII    | 12     | 439        | 312        | 439        | 313        | <b>439</b> | <b>313</b> | 12     | 439        | 312        | 439        | 313        | <b>439</b> | <b>313</b> |
| 450.soplex    | 12     | <b>521</b> | <b>192</b> | 521        | 192        | 519        | 193        | 12     | 483        | 207        | <b>482</b> | <b>208</b> | 480        | 208        |
| 453.povray    | 12     | 194        | 329        | <b>194</b> | <b>328</b> | 195        | 328        | 12     | <b>174</b> | <b>366</b> | 174        | 366        | 176        | 364        |
| 454.calculix  | 12     | 293        | 338        | <b>293</b> | <b>338</b> | 293        | 338        | 12     | 293        | 338        | <b>293</b> | <b>338</b> | 293        | 338        |
| 459.GemsFDTD  | 12     | 592        | 215        | <b>591</b> | <b>215</b> | 591        | 215        | 12     | 592        | 215        | <b>591</b> | <b>215</b> | 591        | 215        |
| 465.tonto     | 12     | 441        | 268        | <b>440</b> | <b>268</b> | 440        | 269        | 12     | 408        | 290        | 407        | 290        | <b>407</b> | <b>290</b> |
| 470.lbm       | 12     | 446        | 370        | 447        | 369        | <b>446</b> | <b>370</b> | 12     | 446        | 370        | 447        | 369        | <b>446</b> | <b>370</b> |
| 481.wrf       | 12     | 364        | 369        | 361        | 371        | <b>361</b> | <b>371</b> | 12     | <b>359</b> | <b>373</b> | 358        | 374        | 365        | 367        |
| 482.sphinx3   | 12     | 897        | 261        | 904        | 259        | <b>901</b> | <b>259</b> | 12     | 900        | 260        | <b>901</b> | <b>260</b> | 905        | 258        |

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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"

## Platform Notes

BIOS Settings:  
 Power Management Policy: Custom  
 Energy Performance: Performance

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## Platform Notes (Continued)

Patrol Scrub: Disabled

## 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"

The Express5800/R120f-1M (Intel Xeon E5-2603 v3) and the Express5800/R120f-2M (Intel Xeon E5-2603 v3) models are electronically equivalent. The results have been measured on the Express5800/R120f-2M (Intel Xeon E5-2603 v3) model.

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled

Filesystem page cache cleared with:

echo 1 > /proc/sys/vm/drop\_caches

runspec command invoked through numactl i.e.:

numactl --interleave=all runspec <etc>

## 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

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## Base Portability Flags (Continued)

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 (except as noted below):

icc -m64

482.sphinx3: icc -m32 -L/opt/intel/composer\_xe\_2015/lib/ia32

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32 -L/opt/intel/composer\_xe\_2015/lib/ia32

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64



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## 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

## Peak Optimization Flags

C benchmarks:

433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)  
-auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3  
-unroll2

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-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(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3

453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4  
-ansi-alias

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## Peak Optimization Flags (Continued)

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(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-

434.zeusmp: basepeak = yes

437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -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(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2)  
-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: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

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

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html>

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

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

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

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



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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