



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

SPECfp<sup>®</sup>\_rate2006 = 481

Express5800/R120f-2M (Intel Xeon E5-2620 v3)

SPECfp\_rate\_base2006 = 471

CPU2006 license: 9006

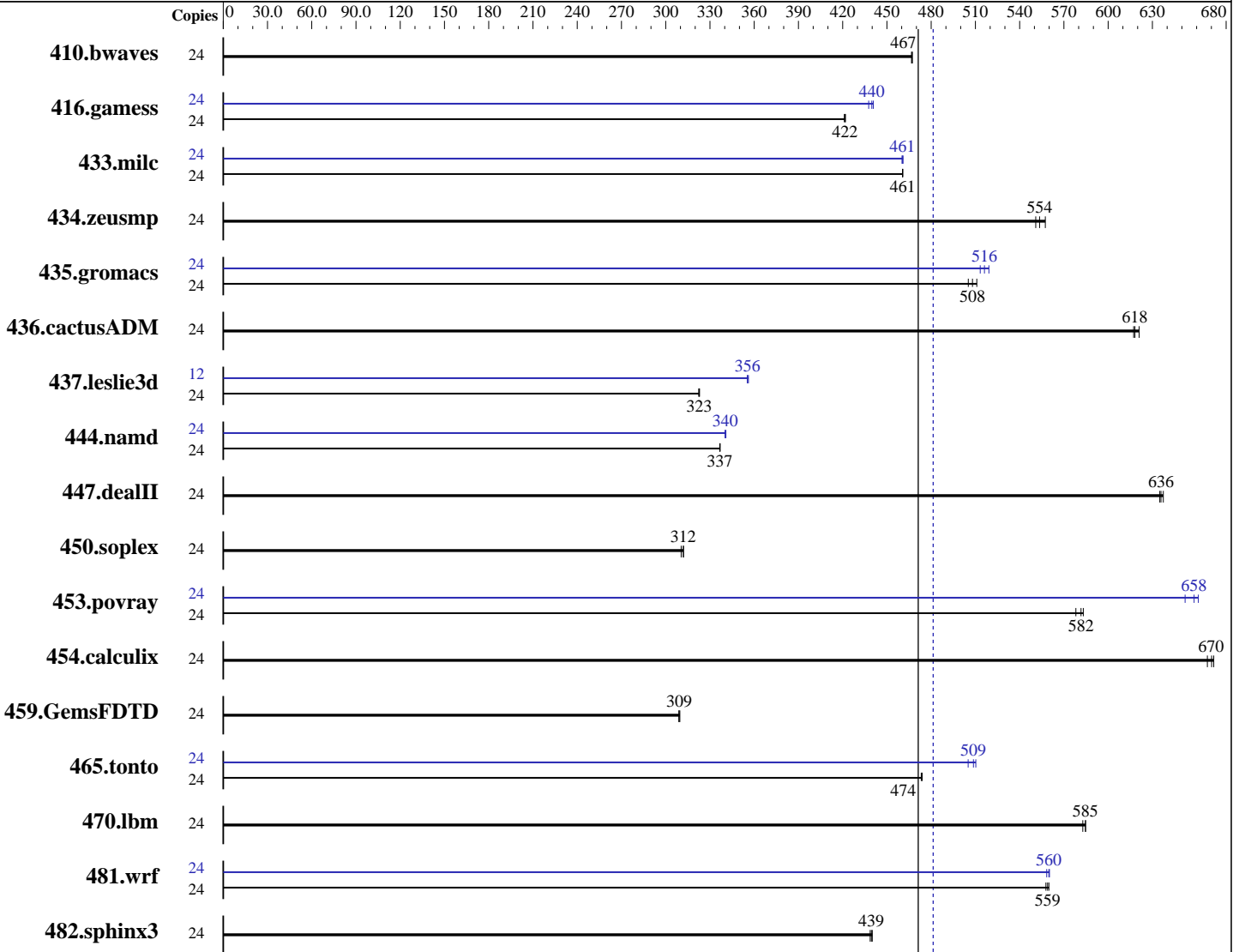
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Oct-2014

Hardware Availability: Feb-2015

Software Availability: Jul-2014



SPECfp\_rate\_base2006 = 471

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### Hardware

CPU Name: Intel Xeon E5-2620 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 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 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 1866 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    | 24     | 699         | 467        | 698        | 467        | <b>698</b>  | <b>467</b> | 24     | 699        | 467        | 698        | 467        | <b>698</b>  | <b>467</b> |  |  |
| 416.gamess    | 24     | <b>1114</b> | <b>422</b> | 1114       | 422        | 1116        | 421        | 24     | 1066       | 441        | 1074       | 438        | <b>1069</b> | <b>440</b> |  |  |
| 433.milc      | 24     | 478         | 461        | 478        | 461        | <b>478</b>  | <b>461</b> | 24     | 478        | 461        | <b>478</b> | <b>461</b> | 479         | 460        |  |  |
| 434.zeusmp    | 24     | 396         | 551        | <b>395</b> | <b>554</b> | 392         | 557        | 24     | 396        | 551        | <b>395</b> | <b>554</b> | 392         | 557        |  |  |
| 435.gromacs   | 24     | <b>337</b>  | <b>508</b> | 335        | 511        | 339         | 505        | 24     | <b>332</b> | <b>516</b> | 334        | 513        | 330         | 519        |  |  |
| 436.cactusADM | 24     | 465         | 617        | <b>464</b> | <b>618</b> | 462         | 621        | 24     | 465        | 617        | <b>464</b> | <b>618</b> | 462         | 621        |  |  |
| 437.leslie3d  | 24     | 699         | 323        | 700        | 322        | <b>699</b>  | <b>323</b> | 12     | 317        | 356        | 317        | 355        | <b>317</b>  | <b>356</b> |  |  |
| 444.namd      | 24     | <b>572</b>  | <b>337</b> | 572        | 337        | 571         | 337        | 24     | 566        | 340        | <b>565</b> | <b>340</b> | 565         | 341        |  |  |
| 447.dealII    | 24     | 432         | 635        | <b>432</b> | <b>636</b> | 431         | 637        | 24     | 432        | 635        | <b>432</b> | <b>636</b> | 431         | 637        |  |  |
| 450.soplex    | 24     | 645         | 310        | <b>642</b> | <b>312</b> | 641         | 312        | 24     | 645        | 310        | <b>642</b> | <b>312</b> | 641         | 312        |  |  |
| 453.povray    | 24     | 219         | 583        | <b>220</b> | <b>582</b> | 221         | 578        | 24     | 196        | 652        | 193        | 661        | <b>194</b>  | <b>658</b> |  |  |
| 454.calculix  | 24     | 297         | 667        | 295        | 672        | <b>295</b>  | <b>670</b> | 24     | 297        | 667        | 295        | 672        | <b>295</b>  | <b>670</b> |  |  |
| 459.GemsFDTD  | 24     | 824         | 309        | <b>824</b> | <b>309</b> | 823         | 310        | 24     | 824        | 309        | <b>824</b> | <b>309</b> | 823         | 310        |  |  |
| 465.tonto     | 24     | 498         | 474        | 499        | 473        | <b>499</b>  | <b>474</b> | 24     | <b>464</b> | <b>509</b> | 463        | 510        | 468         | 505        |  |  |
| 470.lbm       | 24     | 564         | 585        | <b>564</b> | <b>585</b> | 566         | 583        | 24     | 564        | 585        | <b>564</b> | <b>585</b> | 566         | 583        |  |  |
| 481.wrf       | 24     | 479         | 560        | <b>480</b> | <b>559</b> | 481         | 558        | 24     | 479        | 560        | 480        | 558        | <b>479</b>  | <b>560</b> |  |  |
| 482.sphinx3   | 24     | 1063        | 440        | 1066       | 439        | <b>1064</b> | <b>439</b> | 24     | 1063       | 440        | 1066       | 439        | <b>1064</b> | <b>439</b> |  |  |

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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SPECfp\_rate\_base2006 = 471

CPU2006 license: 9006

Test date: Oct-2014

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## Platform Notes (Continued)

Patrol Scrub: Disabled  
Demand 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 E5-2620 v3) and the Express5800/R120f-2M (Intel Xeon E5-2620 v3) models are electronically equivalent. The results have been measured on the Express5800/R120f-2M (Intel Xeon E5-2620 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

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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:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## Peak Portability Flags

Same as Base Portability Flags



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## 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: basepeak = yes

### 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.dealIII: basepeak = yes

450.soplex: basepeak = yes

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

### 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

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## Peak Optimization Flags (Continued)

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-ic14.0-official-linux64.20140128.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-ic14.0-official-linux64.20140128.xml>

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

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