



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

**SPECfp<sup>®</sup>2006 = 126**

Express5800/A2040d (Intel Xeon E7-8867 v4)

**SPECfp\_base2006 = 120**

CPU2006 license: 9006

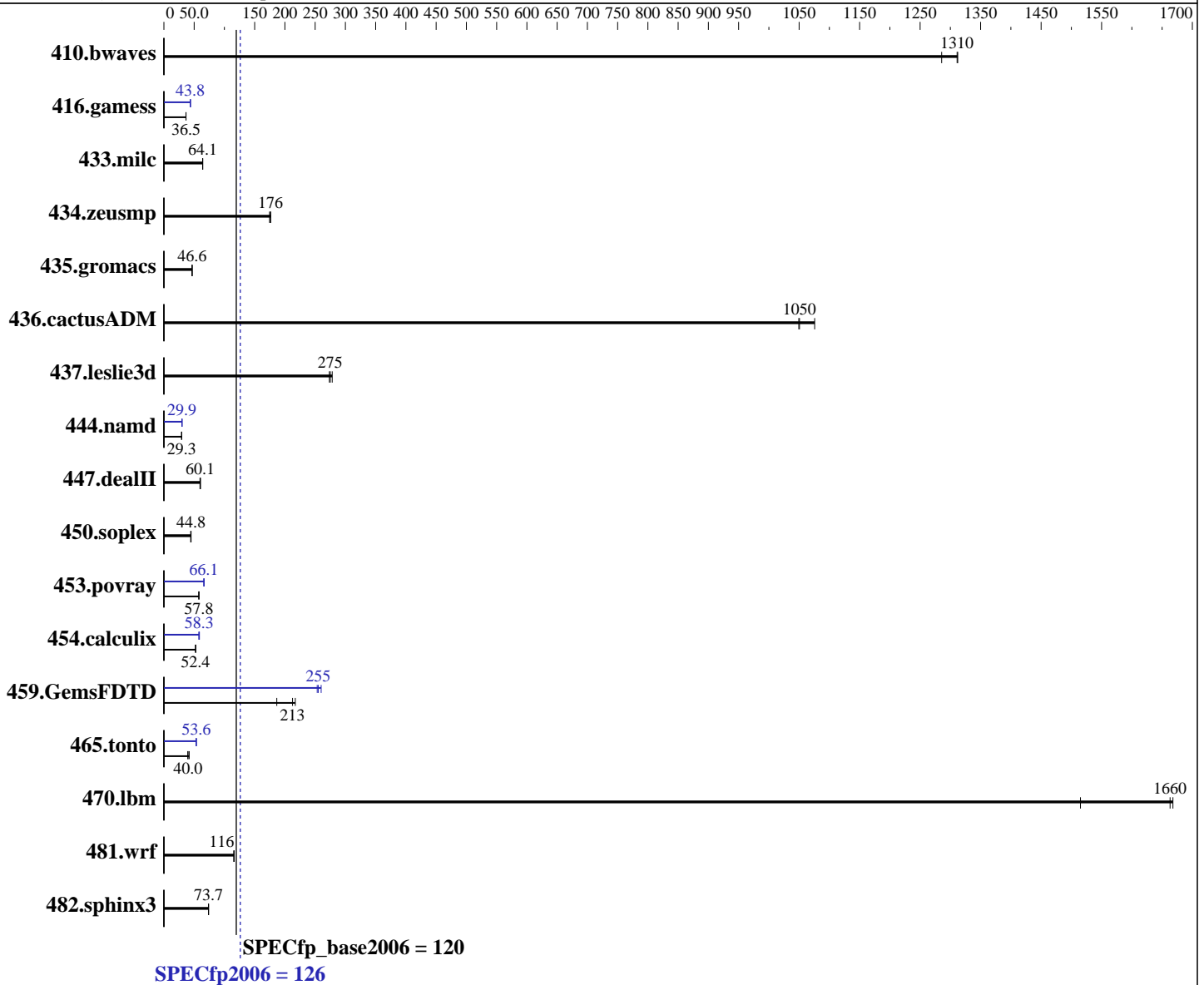
Test date: Apr-2017

Test sponsor: NEC Corporation

Hardware Availability: Sep-2016

Tested by: NEC Corporation

Software Availability: Nov-2016



### Hardware

CPU Name: Intel Xeon E7-8867 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 72 cores, 4 chips, 18 cores/chip  
 CPU(s) orderable: 2,3,4 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 7.3 (Maipo)  
 Kernel 3.10.0-514.el7.x86\_64  
 Compiler: C/C++: Version 16.0.3.210 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.3.210 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs

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L3 Cache: 45 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 1 TB (32 x 32 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
 Disk Subsystem: 1 x 600 GB SAS, 15000 RPM, RAID 0  
 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	<b>10.4</b>	<b>1310</b>	10.4	1310	10.6	1290	<b>10.4</b>	<b>1310</b>	10.4	1310	10.6	1290
416.gamess	536	36.5	538	36.4	<b>537</b>	<b>36.5</b>	448	43.7	<b>447</b>	<b>43.8</b>	447	43.8
433.milc	144	63.9	143	64.1	<b>143</b>	<b>64.1</b>	144	63.9	143	64.1	<b>143</b>	<b>64.1</b>
434.zeusmp	<b>51.7</b>	<b>176</b>	51.5	177	52.1	175	<b>51.7</b>	<b>176</b>	51.5	177	52.1	175
435.gromacs	<b>153</b>	<b>46.6</b>	153	46.6	153	46.6	<b>153</b>	<b>46.6</b>	153	46.6	153	46.6
436.cactusADM	11.1	1080	<b>11.4</b>	<b>1050</b>	11.4	1050	11.1	1080	<b>11.4</b>	<b>1050</b>	11.4	1050
437.leslie3d	33.8	278	34.4	274	<b>34.2</b>	<b>275</b>	33.8	278	34.4	274	<b>34.2</b>	<b>275</b>
444.namd	<b>274</b>	<b>29.3</b>	274	29.3	274	29.3	268	29.9	268	29.9	<b>268</b>	<b>29.9</b>
447.dealII	192	59.6	189	60.4	<b>190</b>	<b>60.1</b>	192	59.6	189	60.4	<b>190</b>	<b>60.1</b>
450.soplex	<b>186</b>	<b>44.8</b>	186	44.9	188	44.2	<b>186</b>	<b>44.8</b>	186	44.9	188	44.2
453.povray	<b>92.0</b>	<b>57.8</b>	92.2	57.7	91.9	57.9	<b>80.0</b>	<b>66.5</b>	<b>80.4</b>	<b>66.1</b>	80.8	65.9
454.calculix	158	52.4	157	52.4	<b>158</b>	<b>52.4</b>	143	57.6	<b>141</b>	<b>58.3</b>	141	58.7
459.GemsFDTD	56.9	187	<b>49.9</b>	<b>213</b>	48.9	217	40.8	260	41.9	253	<b>41.6</b>	<b>255</b>
465.tonto	<b>246</b>	<b>40.0</b>	235	41.8	249	39.5	186	52.9	<b>184</b>	<b>53.6</b>	183	53.8
470.lbm	9.07	1520	8.24	1670	<b>8.26</b>	<b>1660</b>	9.07	1520	8.24	1670	<b>8.26</b>	<b>1660</b>
481.wrf	<b>96.4</b>	<b>116</b>	96.2	116	96.7	116	<b>96.4</b>	<b>116</b>	96.2	116	96.7	116
482.sphinx3	264	73.8	<b>264</b>	<b>73.7</b>	264	73.7	264	73.8	<b>264</b>	<b>73.7</b>	264	73.7

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:  
 Memory RAS Mode: Independent mode  
 VT-x : Disabled  
 Processor C6 Report : Disabled  
 OS Performance Tuning : Disabled  
 Energy Performance : Performance  
 Patrol Scrub : Disabled  
 Demand Scrub : Disabled  
 Memory P.E. Retry : Disabled

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## Platform Notes (Continued)

Hyper-Threading : Disabled

## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact"

LD\_LIBRARY\_PATH = "/opt/SmartHeap\_10mc/lib:/opt/SmartHeap\_10mc/lib64:/opt/intel/compilers\_and\_libraries\_2016.3.210/linux/compiler/lib/ia32\_lin:/opt/intel/compilers\_and\_libraries\_2016.3.210/linux/compiler/lib/intel64\_lin"

OMP\_NUM\_THREADS = "72"

## 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:

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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-A2040d-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-A2040d-RevB.xml>

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