



SPEC[®] CFP2006 Result

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Supermicro

SuperServer 2028UT-BTNRT
(X10DBT-T, Intel Xeon E7-2870 v2)

SPECfp[®]2006 = 94.9

SPECfp_base2006 = 90.5

CPU2006 license: 001176

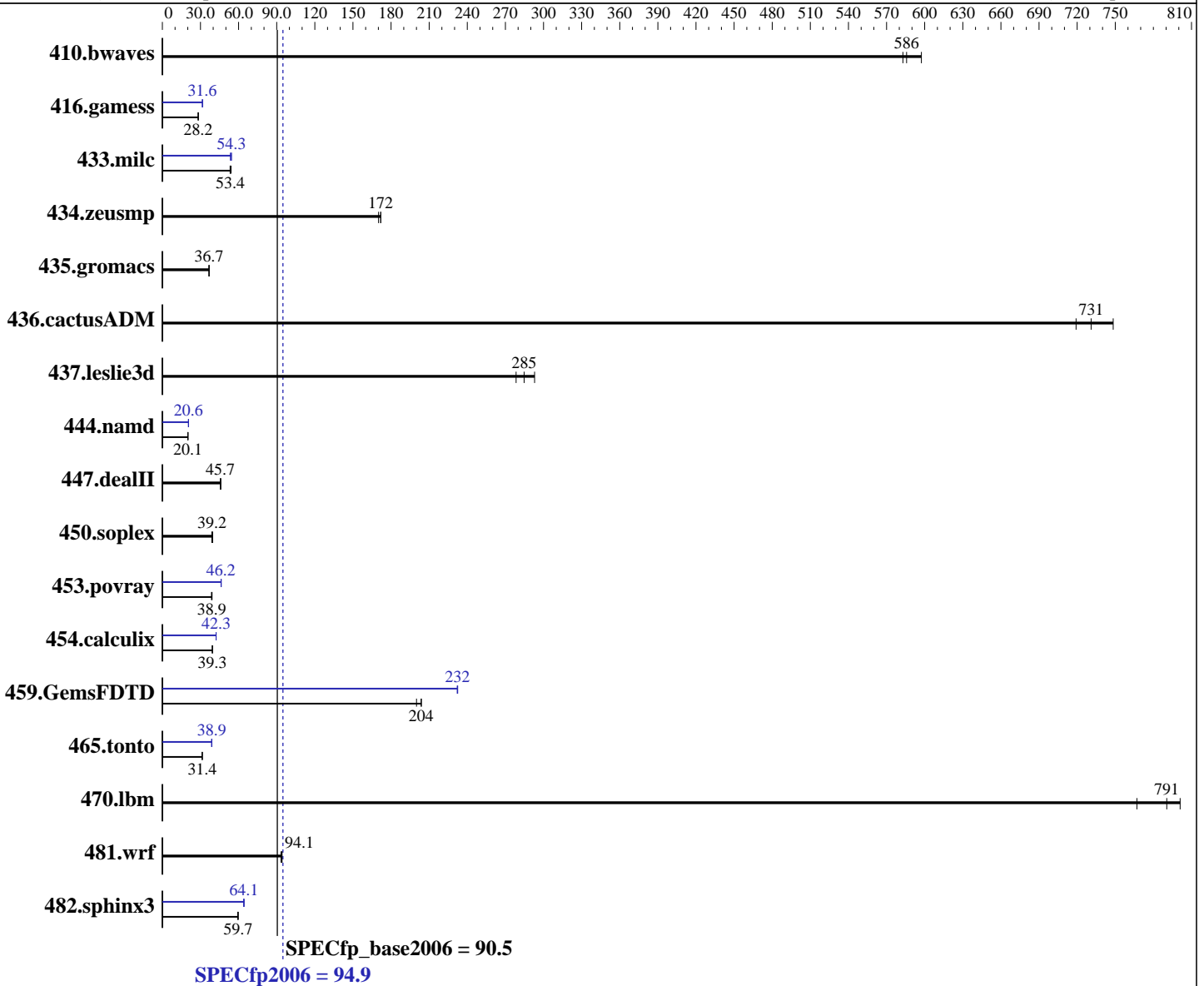
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Dec-2014

Hardware Availability: Oct-2014

Software Availability: Sep-2014



Hardware

CPU Name: Intel Xeon E7-2870 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
 CPU MHz: 2300
 FPU: Integrated
 CPU(s) enabled: 30 cores, 2 chips, 15 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 7.0, Kernel 3.10.0-123.el7.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: Yes
 File System: ext4
 System State: Run level 3 (multi-user)

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (32 x 8 GB 2Rx8 PC3-14900R-13, ECC, running at 1333 MHz)
Disk Subsystem: 1 x 400 GB SATA III, 7200 RPM
Other Hardware: None

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 | 23.3 | 583 | 22.7 | 597 | <u>23.2</u> | <u>586</u> | 23.3 | 583 | 22.7 | 597 | <u>23.2</u> | <u>586</u> |
| 416.gamess | 693 | 28.2 | <u>694</u> | <u>28.2</u> | 694 | 28.2 | 620 | 31.6 | <u>620</u> | <u>31.6</u> | 621 | 31.5 |
| 433.milc | 172 | 53.3 | <u>172</u> | <u>53.4</u> | 170 | 54.1 | 169 | 54.3 | <u>169</u> | <u>54.3</u> | 172 | 53.5 |
| 434.zeusmp | 52.9 | 172 | 53.5 | 170 | <u>53.0</u> | <u>172</u> | 52.9 | 172 | 53.5 | 170 | <u>53.0</u> | <u>172</u> |
| 435.gromacs | 194 | 36.8 | <u>194</u> | <u>36.7</u> | 194 | 36.7 | 194 | 36.8 | <u>194</u> | <u>36.7</u> | 194 | 36.7 |
| 436.cactusADM | 16.0 | 748 | <u>16.3</u> | <u>731</u> | 16.6 | 719 | 16.0 | 748 | <u>16.3</u> | <u>731</u> | 16.6 | 719 |
| 437.leslie3d | 33.8 | 278 | 32.1 | 293 | <u>33.0</u> | <u>285</u> | 33.8 | 278 | 32.1 | 293 | <u>33.0</u> | <u>285</u> |
| 444.namd | <u>398</u> | <u>20.1</u> | 398 | 20.1 | 399 | 20.1 | 390 | 20.6 | <u>390</u> | <u>20.6</u> | 390 | 20.6 |
| 447.dealII | 250 | 45.7 | <u>250</u> | <u>45.7</u> | 249 | 46.0 | 250 | 45.7 | <u>250</u> | <u>45.7</u> | 249 | 46.0 |
| 450.soplex | 211 | 39.6 | 214 | 38.9 | <u>213</u> | <u>39.2</u> | 211 | 39.6 | 214 | 38.9 | <u>213</u> | <u>39.2</u> |
| 453.povray | 136 | 39.1 | <u>137</u> | <u>38.9</u> | 137 | 38.7 | 115 | 46.2 | 115 | 46.4 | <u>115</u> | <u>46.2</u> |
| 454.calculix | 210 | 39.3 | <u>210</u> | <u>39.3</u> | 209 | 39.4 | 195 | 42.2 | 195 | 42.3 | <u>195</u> | <u>42.3</u> |
| 459.GemsFDTD | 52.0 | 204 | 53.0 | 200 | <u>52.1</u> | <u>204</u> | <u>45.7</u> | <u>232</u> | 45.6 | 232 | 45.7 | 232 |
| 465.tonto | 313 | 31.5 | 315 | 31.2 | <u>313</u> | <u>31.4</u> | <u>253</u> | <u>38.9</u> | 254 | 38.7 | 252 | 39.0 |
| 470.lbm | 17.9 | 767 | <u>17.4</u> | <u>791</u> | 17.2 | 801 | 17.9 | 767 | <u>17.4</u> | <u>791</u> | 17.2 | 801 |
| 481.wrf | 120 | 93.4 | <u>119</u> | <u>94.1</u> | 119 | 94.2 | 120 | 93.4 | <u>119</u> | <u>94.1</u> | 119 | 94.2 |
| 482.sphinx3 | 327 | 59.7 | <u>327</u> | <u>59.7</u> | 329 | 59.3 | 303 | 64.4 | <u>304</u> | <u>64.1</u> | 305 | 64.0 |

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:
Hyper-Threading = Disable

General Notes

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

KMP_AFFINITY = "granularity=fine,compact,0,1"

LD_LIBRARY_PATH = "/home/SPEC2K6/SPEC2006-V12/libs/32:/home/SPEC2K6/SPEC2006-V12/libs/64:/home/SPEC2K6/SPEC2006-V12/sh"

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General Notes (Continued)

OMP_NUM_THREADS = "30"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0
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.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

Base Optimization Flags

C benchmarks:
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

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Base Optimization Flags (Continued)

C++ benchmarks:

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:

-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xAVX -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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -auto-ilp32
-ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

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Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xAVX(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: basepeak = yes

459.GemsFDTD: -xAVX(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 -opt-prefetch -parallel

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -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: -xAVX -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-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Supermicro-Platform-Settings-V1.2-revE.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>

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