



# SPEC<sup>®</sup> CFP2006 Result

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## Supermicro

SuperServer 8027R-7RFT+  
(X9QR7-TF+, Intel E5-4640 v2)

SPECfp<sup>®</sup>2006 = **81.9**

SPECfp\_base2006 = **79.7**

CPU2006 license: 001176

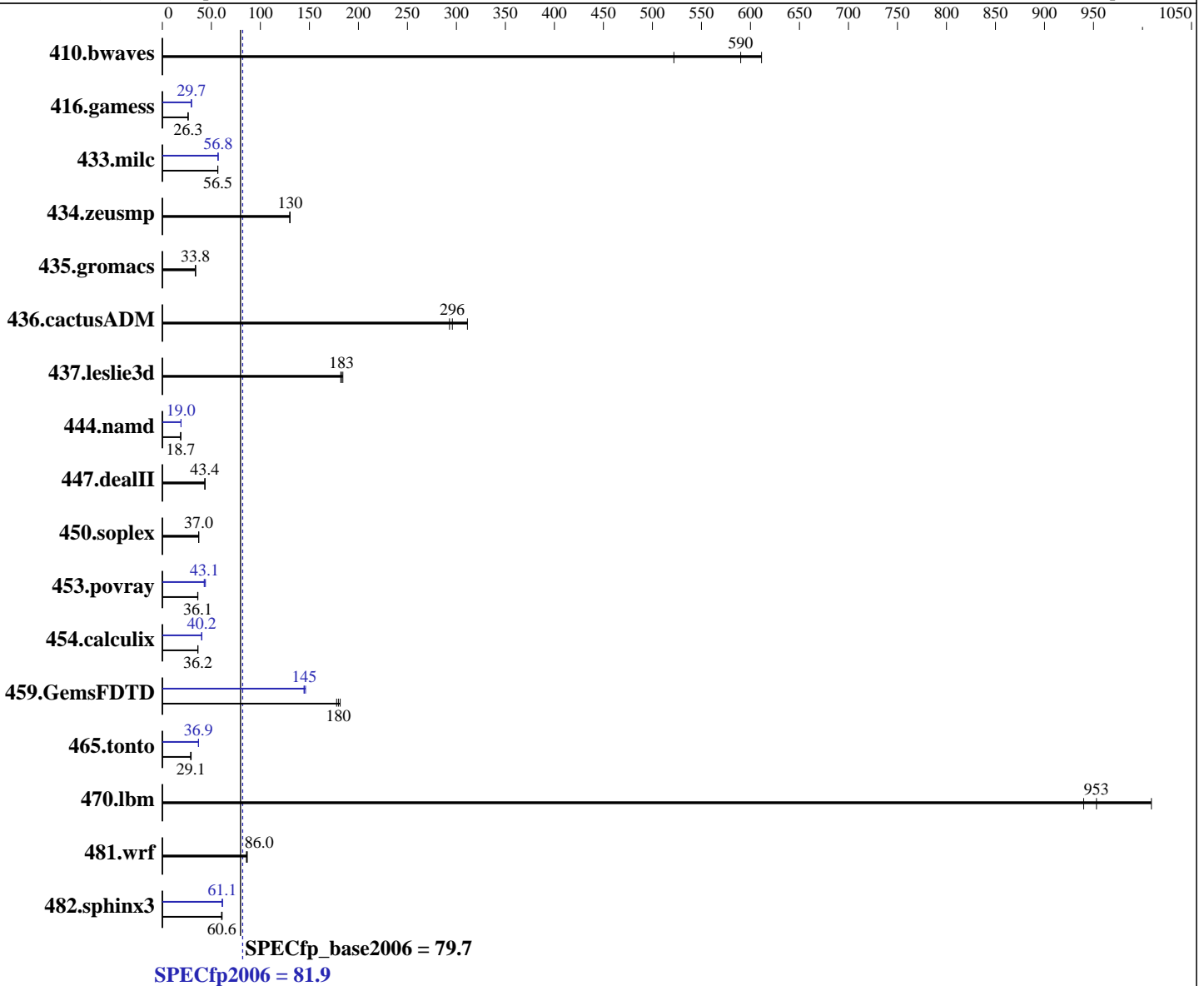
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Jul-2014

Hardware Availability: Aug-2013

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E5-4640 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip  
 CPU(s) orderable: 1,2,4 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 6.5,  
Kernel 2.6.32-431.el6.x86\_64  
 Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE  
for Linux;  
Fortran: Version 14.0.0.080 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: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (32 x 8 GB 2Rx8 PC3-14900R-13, ECC)  
Disk Subsystem: 1 x 512 GB SATA III SSD  
Other Hardware: None

Base Pointers: 32/64-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	26.0	522	<b>23.0</b>	<b>590</b>	22.2	611	26.0	522	<b>23.0</b>	<b>590</b>	22.2	611
416.gamess	745	26.3	747	26.2	<b>746</b>	<b>26.3</b>	660	29.7	<b>660</b>	<b>29.7</b>	661	29.6
433.milc	<b>162</b>	<b>56.5</b>	162	56.6	162	56.5	161	56.9	162	56.8	<b>162</b>	<b>56.8</b>
434.zeusmp	69.8	130	<b>69.9</b>	<b>130</b>	70.0	130	69.8	130	<b>69.9</b>	<b>130</b>	70.0	130
435.gromacs	<b>211</b>	<b>33.8</b>	211	33.8	211	33.8	<b>211</b>	<b>33.8</b>	211	33.8	211	33.8
436.cactusADM	38.4	311	40.8	293	<b>40.4</b>	<b>296</b>	38.4	311	40.8	293	<b>40.4</b>	<b>296</b>
437.leslie3d	51.6	182	<b>51.4</b>	<b>183</b>	51.0	184	51.6	182	<b>51.4</b>	<b>183</b>	51.0	184
444.namd	429	18.7	428	18.7	<b>429</b>	<b>18.7</b>	422	19.0	<b>421</b>	<b>19.0</b>	420	19.1
447.dealII	264	43.4	263	43.4	<b>263</b>	<b>43.4</b>	264	43.4	263	43.4	<b>263</b>	<b>43.4</b>
450.soplex	225	37.0	224	37.2	<b>225</b>	<b>37.0</b>	225	37.0	224	37.2	<b>225</b>	<b>37.0</b>
453.povray	147	36.3	148	36.0	<b>147</b>	<b>36.1</b>	<b>124</b>	<b>43.1</b>	121	44.0	125	42.7
454.calculix	228	36.3	228	36.2	<b>228</b>	<b>36.2</b>	<b>205</b>	<b>40.2</b>	206	40.1	205	40.2
459.GemsFDTD	59.7	178	58.5	181	<b>59.1</b>	<b>180</b>	73.4	144	72.6	146	<b>73.2</b>	<b>145</b>
465.tonto	335	29.4	<b>338</b>	<b>29.1</b>	342	28.8	266	37.0	<b>267</b>	<b>36.9</b>	268	36.7
470.lbm	14.6	940	13.6	1010	<b>14.4</b>	<b>953</b>	14.6	940	13.6	1010	<b>14.4</b>	<b>953</b>
481.wrf	130	85.9	129	86.7	<b>130</b>	<b>86.0</b>	130	85.9	129	86.7	<b>130</b>	<b>86.0</b>
482.sphinx3	<b>322</b>	<b>60.6</b>	320	61.0	323	60.4	<b>319</b>	<b>61.1</b>	318	61.4	319	61.0

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"

## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact,0,1"

LD\_LIBRARY\_PATH = "/home/SPEC-CPU/SPEC2006\_v11/libs/32:/home/SPEC-CPU/SPEC2006\_v11/libs/64:/home/SPEC-CPU/SPEC2006\_v11/sh"

OMP\_NUM\_THREADS = "40"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4

Transparent Huge Pages enabled with:

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

runspec command invoked through numactl i.e.:

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## General Notes (Continued)

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  
 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

C++ benchmarks:

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

Fortran benchmarks:

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

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## Base Optimization Flags (Continued)

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`

447.dealIII: `basepeak = yes`

450.soplex: `basepeak = yes`

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## Peak Optimization Flags (Continued)

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

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

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

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