



# SPEC<sup>®</sup> CFP2006 Result

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## Oracle Corporation

SPECfp<sup>®</sup>2006 = **38.4**

Sun Fire X4170 M2 (Intel Xeon L5640 2.27 GHz)

SPECfp\_base2006 = **35.7**

CPU2006 license: 6

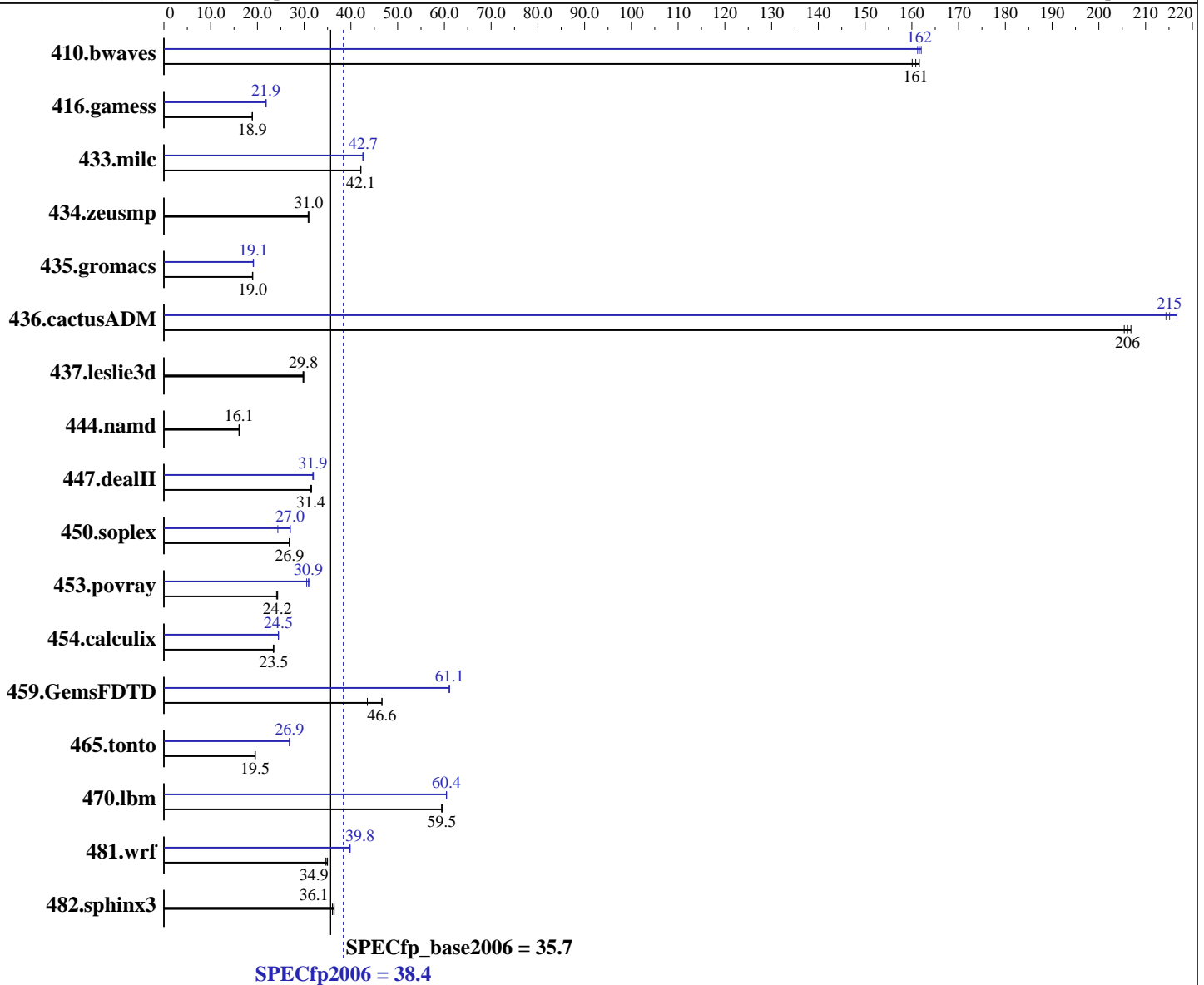
Test sponsor: Oracle Corporation

Tested by: Oracle Corporation

Test date: Sep-2010

Hardware Availability: Jun-2010

Software Availability: Apr-2010



### Hardware

CPU Name: Intel Xeon L5640  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz  
 CPU MHz: 2267  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 2 threads/core  
 CPU(s) orderable: 1 or 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: Oracle Enterprise Linux Server release 5.5 kernel 2.6.18-194.el5  
 Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1 Build 20091130 Package ID: l\_cproc\_p\_11.1.064, l\_cprof\_p\_11.1.064  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)

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L3 Cache: 12 MB I+D on chip per chip  
Other Cache: None  
Memory: 48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC)  
Disk Subsystem: 1 x 146 GB SAS, 10000 RPM  
Other Hardware: None

Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: Binutils 2.18.50.0.7.20080502

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	84.9	160	<b>84.5</b>	<b>161</b>	84.1	162	83.9	162	<b>84.1</b>	<b>162</b>	84.3	161
416.gamess	1035	18.9	<b>1035</b>	<b>18.9</b>	1036	18.9	896	21.9	<b>896</b>	<b>21.9</b>	899	21.8
433.milc	218	42.1	<b>218</b>	<b>42.1</b>	218	42.1	216	42.5	<b>215</b>	<b>42.7</b>	215	42.7
434.zeusmp	294	31.0	295	30.9	<b>294</b>	<b>31.0</b>	294	31.0	295	30.9	<b>294</b>	<b>31.0</b>
435.gromacs	376	19.0	377	18.9	<b>376</b>	<b>19.0</b>	372	19.2	<b>373</b>	<b>19.1</b>	374	19.1
436.cactusADM	<b>58.0</b>	<b>206</b>	57.8	207	58.2	205	55.7	214	<b>55.5</b>	<b>215</b>	55.1	217
437.leslie3d	316	29.7	<b>315</b>	<b>29.8</b>	314	29.9	316	29.7	<b>315</b>	<b>29.8</b>	314	29.9
444.namd	499	16.1	<b>499</b>	<b>16.1</b>	498	16.1	499	16.1	<b>499</b>	<b>16.1</b>	498	16.1
447.dealII	364	31.4	<b>364</b>	<b>31.4</b>	362	31.6	358	32.0	<b>359</b>	<b>31.9</b>	359	31.9
450.soplex	<b>310</b>	<b>26.9</b>	310	26.9	311	26.8	308	27.0	<b>309</b>	<b>27.0</b>	342	24.4
453.povray	221	24.1	<b>219</b>	<b>24.2</b>	219	24.3	174	30.5	171	31.1	<b>172</b>	<b>30.9</b>
454.calculix	353	23.4	351	23.5	<b>351</b>	<b>23.5</b>	337	24.5	<b>337</b>	<b>24.5</b>	337	24.5
459.GemsFDTD	<b>228</b>	<b>46.6</b>	244	43.5	227	46.7	174	61.1	174	61.0	<b>174</b>	<b>61.1</b>
465.tonto	505	19.5	503	19.6	<b>504</b>	<b>19.5</b>	<b>366</b>	<b>26.9</b>	366	26.9	366	26.9
470.lbm	<b>231</b>	<b>59.5</b>	231	59.4	231	59.5	227	60.4	<b>227</b>	<b>60.4</b>	227	60.5
481.wrf	322	34.6	<b>320</b>	<b>34.9</b>	319	35.0	280	39.8	<b>281</b>	<b>39.8</b>	281	39.8
482.sphinx3	<b>540</b>	<b>36.1</b>	540	36.1	535	36.4	<b>540</b>	<b>36.1</b>	540	36.1	535	36.4

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

## Operating System Notes

'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run  
OMP\_NUM\_THREADS set to number of cores  
KMP\_AFFINITY set to granularity=fine,scatter  
KMP\_STACKSIZE set to 200M

## Platform Notes

Load Default BIOS Settings and then change the following  
Data Reuse Optimization Disabled  
Hardware Prefetch Enabled  
Adjacent Cache Line Prefetch Enabled  
L1 Data Prefetch Enabled



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## General Notes

This result is measured on a Sun Fire X4170 M2 server. The Sun Fire X4170 M2 and the Sun Fire X4270 M2 are electronically equivalent.

## 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:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

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## Base Optimization Flags (Continued)

Fortran benchmarks:

`-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

Benchmarks using both Fortran and C:

`-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

## 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: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-ansi-alias`

470.lbm: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-parallel -ansi-alias -auto-ilp32`

482.sphinx3: `basepeak = yes`

C++ benchmarks:

444.namd: `basepeak = yes`

447.dealIII: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -ansi-alias -scalar-rep- -auto-ilp32`

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## Peak Optimization Flags (Continued)

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3 -auto-ilp32

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -ansi-alias

### Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch  
-parallel

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -ansi-alias -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -opt-prefetch -parallel

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-inline-calloc -opt-malloc-options=3 -auto -unroll4

### Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-prefetch -auto-ilp32

436.cactusADM: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -opt-prefetch -parallel -auto-ilp32

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32

481.wrf: Same as 454.calculix

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

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE-pathfix-smartheap.20101027.html>

[http://www.spec.org/cpu2006/flags/Oracle-platform-x86\\_64.20101027.html](http://www.spec.org/cpu2006/flags/Oracle-platform-x86_64.20101027.html)



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

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