



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>2006 = 57.0

PowerEdge M610 (Intel Xeon X5650, 2.66 GHz)

SPECfp\_base2006 = 53.6

CPU2006 license: 55

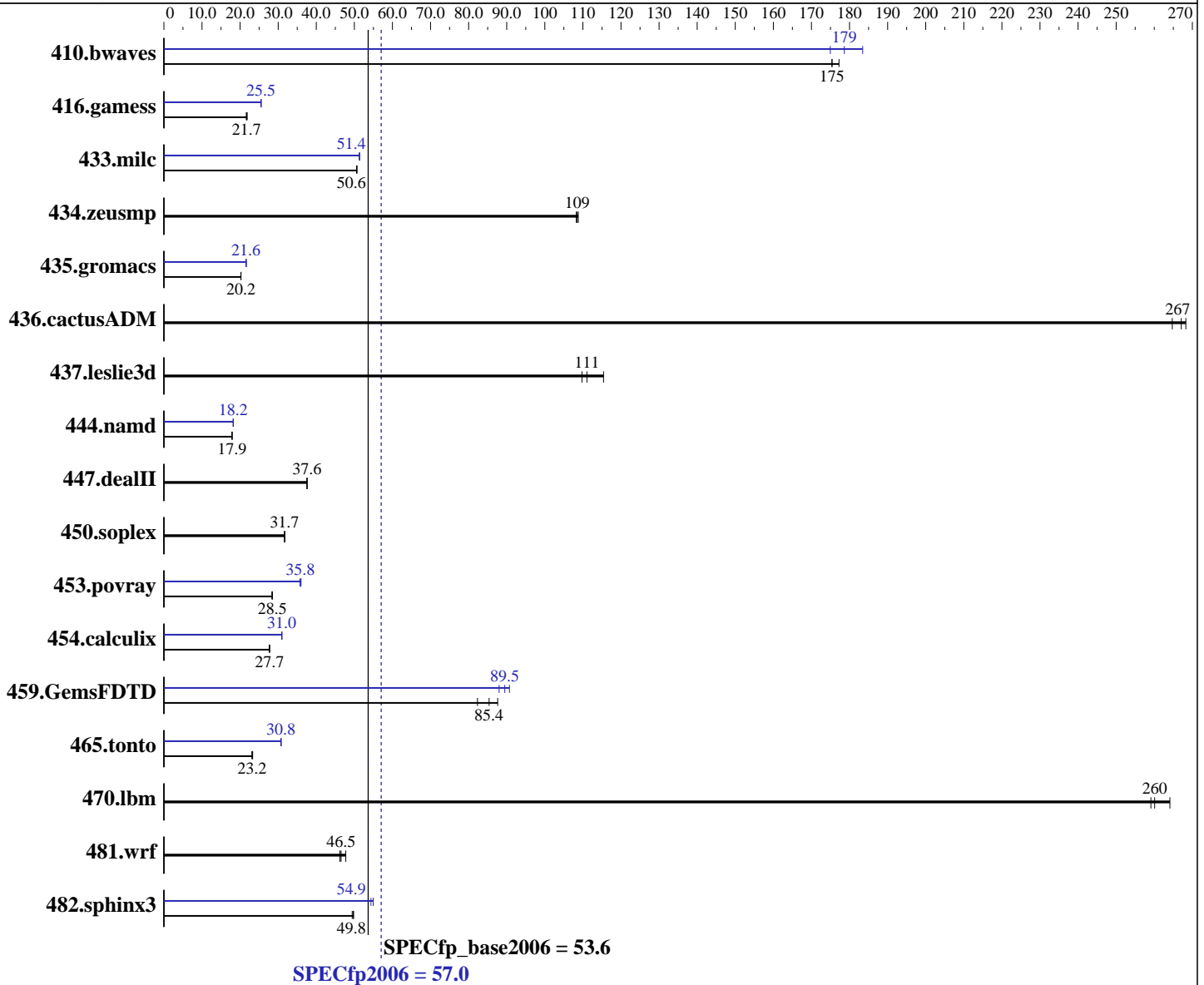
Test date: Jul-2011

Test sponsor: Dell Inc.

Hardware Availability: Mar-2010

Tested by: Dell Inc.

Software Availability: Dec-2009



## Hardware

CPU Name: Intel Xeon X5650  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.06 GHz  
 CPU MHz: 2667  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 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

Continued on next page

## Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64),  
 Kernel 2.6.32.12-0.7-default  
 Compiler: Intel C++ and Fortran Intel 64 Compiler XE for  
 applications running on Intel 64  
 Version 12.0 Update 3  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit

Continued on next page



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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 10000 RPM SAS  
 Other Hardware: None

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	76.7	177	<b><u>77.5</u></b>	<b><u>175</u></b>	77.5	175	<b><u>77.7</u></b>	175	74.1	183	<b><u>76.1</u></b>	<b><u>179</u></b>
416.gamess	<b><u>902</u></b>	<b><u>21.7</u></b>	905	21.6	896	21.9	<b><u>767</u></b>	<b><u>25.5</u></b>	768	25.5	767	25.5
433.milc	<b><u>181</u></b>	<b><u>50.6</u></b>	181	50.7	181	50.6	<b><u>179</u></b>	<b><u>51.4</u></b>	179	51.4	179	51.3
434.zeusmp	83.7	109	<b><u>83.9</u></b>	<b><u>109</u></b>	84.1	108	83.7	109	<b><u>83.9</u></b>	<b><u>109</u></b>	84.1	108
435.gromacs	<b><u>353</u></b>	<b><u>20.2</u></b>	353	20.2	353	20.2	330	21.6	<b><u>331</u></b>	<b><u>21.6</u></b>	331	21.6
436.cactusADM	<b><u>44.7</u></b>	<b><u>267</u></b>	45.1	265	44.5	268	<b><u>44.7</u></b>	<b><u>267</u></b>	45.1	265	44.5	268
437.leslie3d	85.6	110	<b><u>84.6</u></b>	<b><u>111</u></b>	81.4	115	85.6	110	<b><u>84.6</u></b>	<b><u>111</u></b>	81.4	115
444.namd	448	17.9	448	17.9	<b><u>448</u></b>	<b><u>17.9</u></b>	441	18.2	<b><u>441</u></b>	<b><u>18.2</u></b>	440	18.2
447.dealII	304	37.6	304	37.6	<b><u>304</u></b>	<b><u>37.6</u></b>	304	37.6	304	37.6	<b><u>304</u></b>	<b><u>37.6</u></b>
450.soplex	<b><u>263</u></b>	<b><u>31.7</u></b>	263	31.7	263	31.7	<b><u>263</u></b>	<b><u>31.7</u></b>	263	31.7	263	31.7
453.povray	<b><u>187</u></b>	<b><u>28.5</u></b>	187	28.5	188	28.4	149	35.7	<b><u>148</u></b>	<b><u>35.8</u></b>	148	36.0
454.calculix	297	27.8	<b><u>298</u></b>	<b><u>27.7</u></b>	298	27.7	266	31.0	<b><u>266</u></b>	<b><u>31.0</u></b>	267	30.9
459.GemsFDTD	129	82.3	<b><u>124</u></b>	<b><u>85.4</u></b>	121	87.6	117	90.7	121	88.0	<b><u>119</u></b>	<b><u>89.5</u></b>
465.tonto	422	23.3	<b><u>425</u></b>	<b><u>23.2</u></b>	426	23.1	320	30.7	320	30.8	<b><u>320</u></b>	<b><u>30.8</u></b>
470.lbm	<b><u>52.8</u></b>	<b><u>260</u></b>	52.0	264	53.0	259	<b><u>52.8</u></b>	<b><u>260</u></b>	52.0	264	53.0	259
481.wrf	<b><u>240</u></b>	<b><u>46.5</u></b>	234	47.7	242	46.2	<b><u>240</u></b>	<b><u>46.5</u></b>	234	47.7	242	46.2
482.sphinx3	<b><u>392</u></b>	<b><u>49.8</u></b>	394	49.4	392	49.8	<b><u>355</u></b>	<b><u>54.9</u></b>	355	55.0	359	54.4

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

'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages

```
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

BIOS Settings:

Power Management = Maximum Performance (Default = Active Power Controller)

Data Reuse = Disabled (Default = Enabled)

Logical Processor = Disabled (Default = Enabled)



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## General Notes

OMP\_NUM\_THREADS set to number of cores  
Binaries were compiled on RHEL5.5

## 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  
-ansi-alias

C++ benchmarks:

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

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

470.lbm: `basepeak = yes`

482.sphinx3: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel`

C++ benchmarks:

444.namd: `-xSSE4.2(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.deallI: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### Fortran benchmarks:

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

416.gamess: -xSSE4.2(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- -static

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) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(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  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### 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) -prof-use(pass 2) -static -auto-ilp32  
-ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -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-ic12.0-linux64-revB.html>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml>

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

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