



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>2006 = 57.5

PowerEdge R610 (Intel Xeon X5650, 2.66 GHz)

SPECfp\_base2006 = 53.7

CPU2006 license: 55

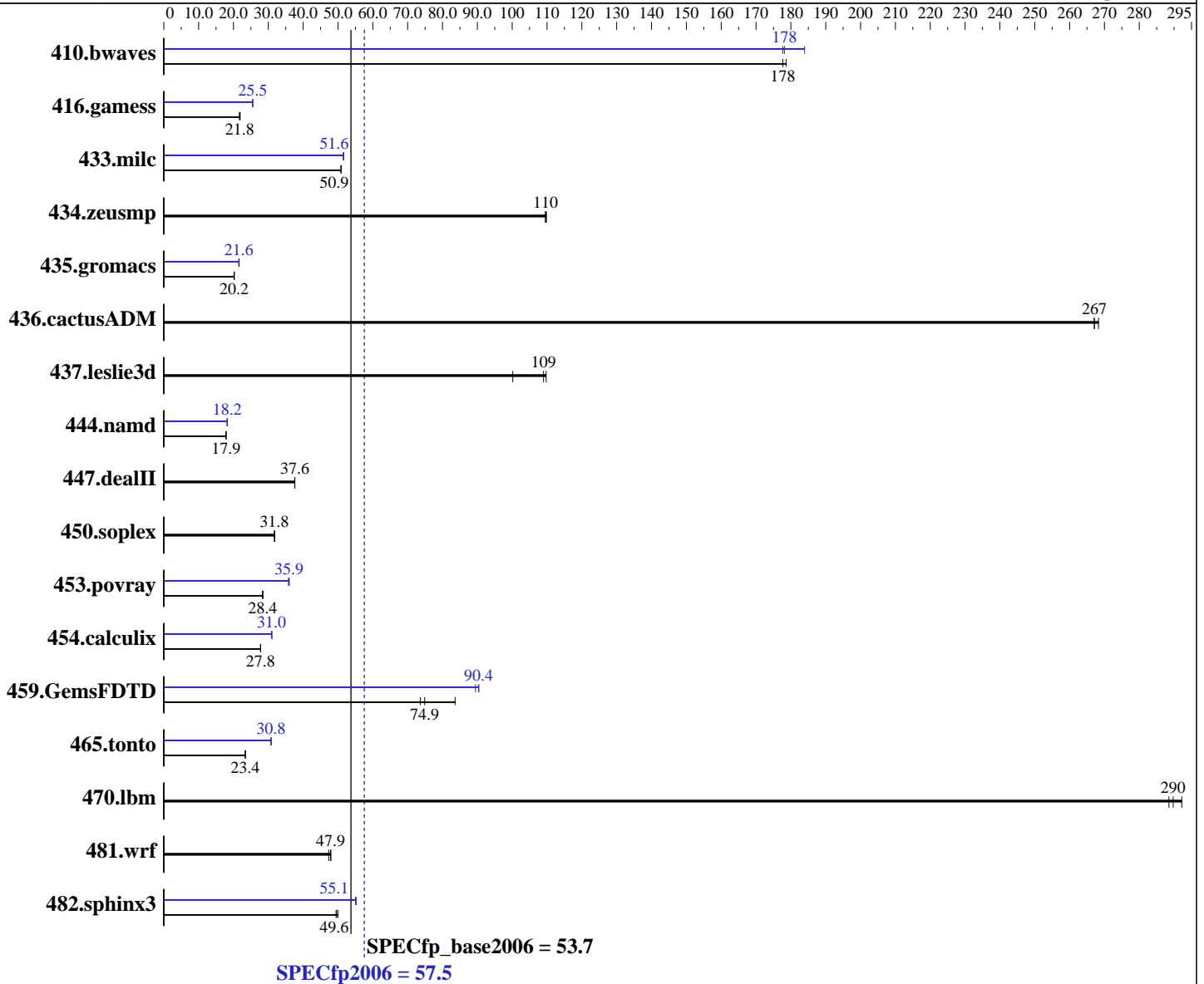
Test date: Apr-2011

Test sponsor: Dell Inc.

Hardware Availability: Mar-2010

Tested by: Dell Inc.

Software Availability: Apr-2011



## 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

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## 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

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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 15000 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	<b><u>76.5</u></b>	<b><u>178</u></b>	76.1	179	76.5	178	73.9	184	<b><u>76.3</u></b>	<b><u>178</u></b>	76.5	178
416.gamess	902	21.7	<b><u>898</u></b>	<b><u>21.8</u></b>	893	21.9	<b><u>767</u></b>	<b><u>25.5</u></b>	770	25.4	766	25.6
433.milc	180	50.9	<b><u>180</u></b>	<b><u>50.9</u></b>	180	50.9	<b><u>178</u></b>	<b><u>51.6</u></b>	178	51.6	178	51.5
434.zeusmp	82.9	110	83.1	110	<b><u>83.1</u></b>	<b><u>110</u></b>	82.9	110	83.1	110	<b><u>83.1</u></b>	<b><u>110</u></b>
435.gromacs	354	20.2	<b><u>353</u></b>	<b><u>20.2</u></b>	353	20.2	332	21.5	<b><u>331</u></b>	<b><u>21.6</u></b>	330	21.6
436.cactusADM	44.5	268	44.7	267	<b><u>44.7</u></b>	<b><u>267</u></b>	44.5	268	44.7	267	<b><u>44.7</u></b>	<b><u>267</u></b>
437.leslie3d	<b><u>86.2</u></b>	<b><u>109</u></b>	85.6	110	93.8	100	<b><u>86.2</u></b>	<b><u>109</u></b>	85.6	110	93.8	100
444.namd	449	17.9	<b><u>449</u></b>	<b><u>17.9</u></b>	449	17.9	440	18.2	441	18.2	<b><u>441</u></b>	<b><u>18.2</u></b>
447.dealII	<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>	304	37.6	304	37.6
450.soplex	262	31.8	263	31.8	<b><u>262</u></b>	<b><u>31.8</u></b>	262	31.8	263	31.8	<b><u>262</u></b>	<b><u>31.8</u></b>
453.povray	188	28.3	187	28.5	<b><u>187</u></b>	<b><u>28.4</u></b>	<b><u>148</u></b>	<b><u>35.9</u></b>	149	35.8	148	36.0
454.calculix	<b><u>297</u></b>	<b><u>27.8</u></b>	297	27.8	297	27.8	266	31.0	266	31.0	<b><u>266</u></b>	<b><u>31.0</u></b>
459.GemsFDTD	127	83.6	<b><u>142</u></b>	<b><u>74.9</u></b>	144	73.6	119	89.5	117	90.4	<b><u>117</u></b>	<b><u>90.4</u></b>
465.tonto	<b><u>421</u></b>	<b><u>23.4</u></b>	420	23.4	421	23.4	320	30.8	<b><u>320</u></b>	<b><u>30.8</u></b>	319	30.8
470.lbm	<b><u>47.4</u></b>	<b><u>290</u></b>	47.6	289	47.0	292	<b><u>47.4</u></b>	<b><u>290</u></b>	47.6	289	47.0	292
481.wrf	<b><u>233</u></b>	<b><u>47.9</u></b>	236	47.3	233	48.0	<b><u>233</u></b>	<b><u>47.9</u></b>	236	47.3	233	48.0
482.sphinx3	390	50.0	<b><u>393</u></b>	<b><u>49.6</u></b>	394	49.4	<b><u>354</u></b>	<b><u>55.1</u></b>	354	55.0	353	55.2

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  
The Dell PowerEdge R610 and the Bull NovaScale R440 F2 models are electronically equivalent. The results have been measured on a Dell PowerEdge R610 model  
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.deallI: -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

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## Base Optimization Flags (Continued)

C++ benchmarks:

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

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:

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## Peak Optimization Flags (Continued)

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

447.dealII: 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



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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-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>

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

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

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