



# SPEC<sup>®</sup> CFP2006 Result

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## Dell Inc.

SPECfp<sup>®</sup>2006 = 45.7

PowerEdge M910 (Intel Xeon E7-2820, 2.00 GHz)

SPECfp\_base2006 = 41.4

CPU2006 license: 55

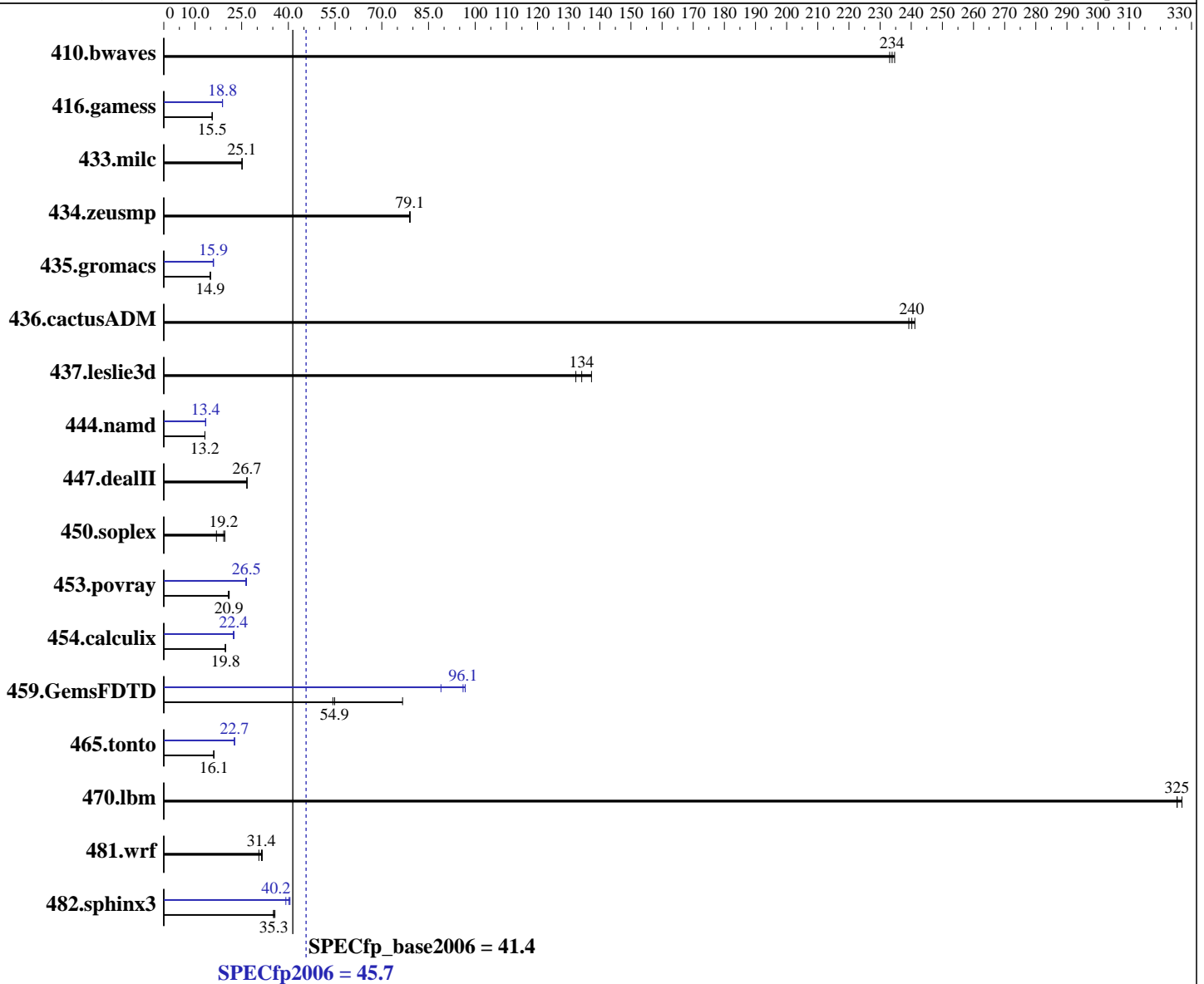
Test date: May-2011

Test sponsor: Dell Inc.

Hardware Availability: Apr-2011

Tested by: Dell Inc.

Software Availability: Apr-2011



### Hardware

CPU Name: Intel Xeon E7-2820  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.26 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip  
 CPU(s) orderable: 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: 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: 18 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (32 x 8 GB 4Rx8 PC3L-8500R-7, ECC, running at 978 MHz)  
 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	58.3	233	<b>58.1</b>	<b>234</b>	57.9	235	58.3	233	<b>58.1</b>	<b>234</b>	57.9	235
416.gamess	<b>1259</b>	<b>15.5</b>	1257	15.6	1261	15.5	<b>1039</b>	<b>18.8</b>	1039	18.8	1040	18.8
433.milc	364	25.2	366	25.1	<b>366</b>	<b>25.1</b>	364	25.2	366	25.1	<b>366</b>	<b>25.1</b>
434.zeusmp	115	79.1	115	78.9	<b>115</b>	<b>79.1</b>	115	79.1	115	78.9	<b>115</b>	<b>79.1</b>
435.gromacs	479	14.9	476	15.0	<b>478</b>	<b>14.9</b>	447	16.0	450	15.9	<b>449</b>	<b>15.9</b>
436.cactusADM	50.0	239	<b>49.8</b>	<b>240</b>	49.6	241	50.0	239	<b>49.8</b>	<b>240</b>	49.6	241
437.leslie3d	68.4	137	71.0	132	<b>70.0</b>	<b>134</b>	68.4	137	71.0	132	<b>70.0</b>	<b>134</b>
444.namd	607	13.2	<b>607</b>	<b>13.2</b>	607	13.2	597	13.4	<b>597</b>	<b>13.4</b>	596	13.5
447.dealII	428	26.7	429	26.7	<b>428</b>	<b>26.7</b>	428	26.7	429	26.7	<b>428</b>	<b>26.7</b>
450.soplex	493	16.9	<b>434</b>	<b>19.2</b>	425	19.6	493	16.9	<b>434</b>	<b>19.2</b>	425	19.6
453.povray	257	20.7	<b>254</b>	<b>20.9</b>	253	21.0	202	26.3	<b>201</b>	<b>26.5</b>	200	26.5
454.calculix	<b>416</b>	<b>19.8</b>	418	19.7	416	19.8	369	22.4	<b>368</b>	<b>22.4</b>	366	22.6
459.GemsFDTD	195	54.3	138	76.7	<b>193</b>	<b>54.9</b>	<b>110</b>	<b>96.1</b>	119	89.0	110	96.8
465.tonto	610	16.1	616	16.0	<b>611</b>	<b>16.1</b>	432	22.8	434	22.7	<b>434</b>	<b>22.7</b>
470.lbm	42.0	327	42.2	325	<b>42.2</b>	<b>325</b>	42.0	327	42.2	325	<b>42.2</b>	<b>325</b>
481.wrf	366	30.5	353	31.6	<b>356</b>	<b>31.4</b>	366	30.5	353	31.6	<b>356</b>	<b>31.4</b>
482.sphinx3	<b>552</b>	<b>35.3</b>	553	35.2	546	35.7	497	39.2	481	40.5	<b>485</b>	<b>40.2</b>

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)  
 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: basepeak = yes

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

447.dealIII: basepeak = yes

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## Peak Optimization Flags (Continued)

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: basepeak = yes

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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