



# SPEC® CFP2006 Result

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## Dell Inc.

PowerEdge M820 (Intel Xeon E5-4610 v2,  
2.30 GHz)

SPECfp®2006 = **65.8**

SPECfp\_base2006 = **62.3**

CPU2006 license: 55

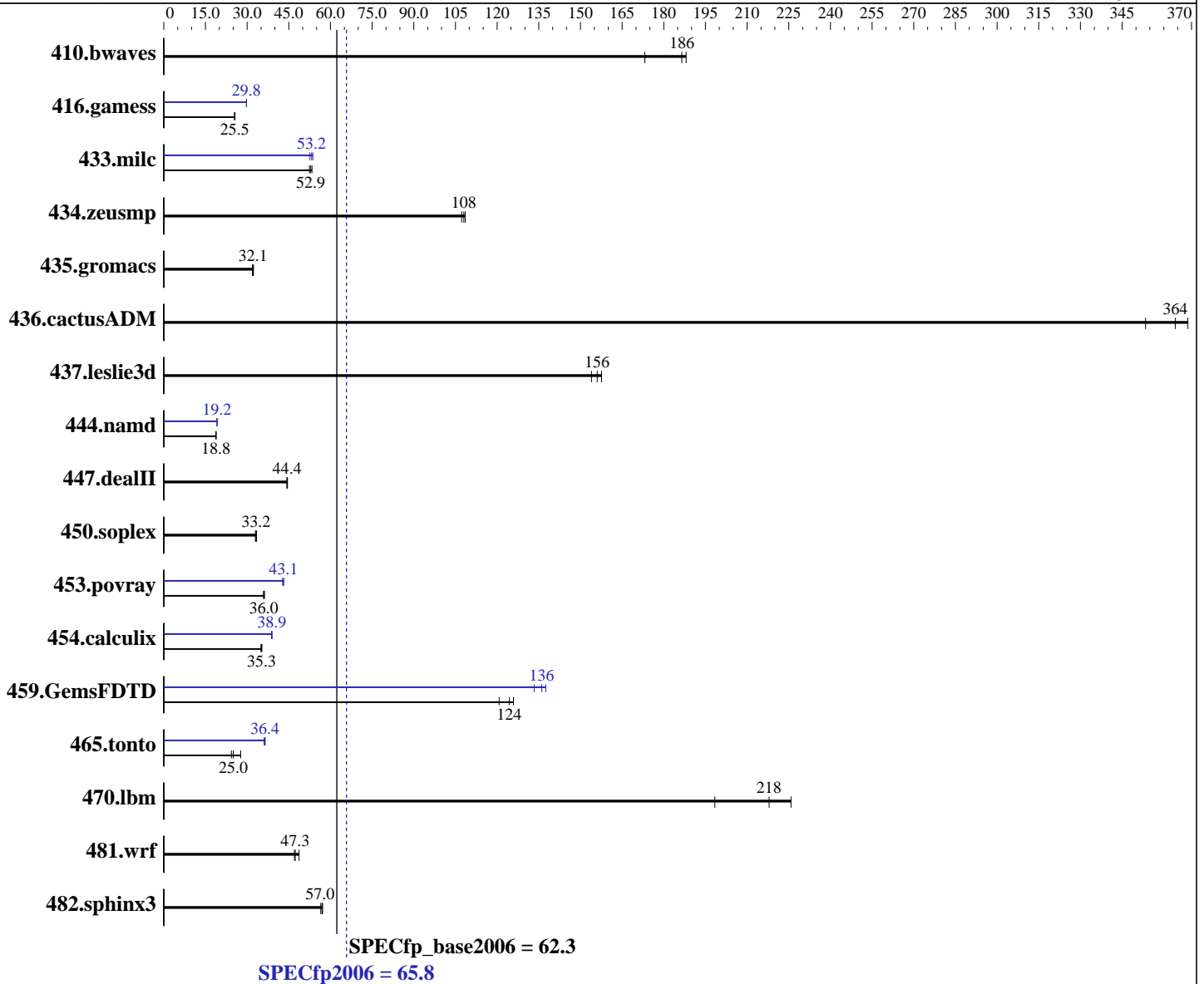
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Feb-2014

Hardware Availability: Mar-2014

Software Availability: Aug-2013



### Hardware

CPU Name: Intel Xeon E5-4610 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip  
 CPU(s) orderable: 4 chip  
 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 (x86\_64)  
 SUSE Linux Enterprise Server 11 (x86\_64)  
 3.0.76-0.11-default  
 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: ext2

Continued on next page



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L3 Cache: 16 MB I+D on chip per chip  
Other Cache: None  
Memory: 512 GB (32 x 16 GB 2Rx4 PC3-14900R-13, ECC)  
Disk Subsystem: 1 x 600 GB 10000 RPM SAS  
Other Hardware: None

System State: Run level 3 (multi-user)  
Base Pointers: 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	<u>72.9</u>	<u>186</u>	72.3	188	78.5	173	<u>72.9</u>	<u>186</u>	72.3	188	78.5	173
416.gamess	<u>767</u>	<u>25.5</u>	764	25.6	769	25.4	<u>658</u>	<u>29.8</u>	658	29.8	658	29.8
433.milc	<u>174</u>	<u>52.9</u>	172	53.3	175	52.4	<u>172</u>	<u>53.2</u>	175	52.6	171	53.7
434.zeusmp	83.8	109	<u>84.3</u>	<u>108</u>	84.8	107	83.8	109	<u>84.3</u>	<u>108</u>	84.8	107
435.gromacs	224	31.9	221	32.3	<u>222</u>	<u>32.1</u>	224	31.9	221	32.3	<u>222</u>	<u>32.1</u>
436.cactusADM	32.4	369	<u>32.8</u>	<u>364</u>	33.8	353	32.4	369	<u>32.8</u>	<u>364</u>	33.8	353
437.leslie3d	59.6	158	61.0	154	<u>60.2</u>	<u>156</u>	59.6	158	61.0	154	<u>60.2</u>	<u>156</u>
444.namd	427	18.8	<u>427</u>	<u>18.8</u>	427	18.8	418	19.2	418	19.2	<u>418</u>	<u>19.2</u>
447.dealII	258	44.3	<u>258</u>	<u>44.4</u>	257	44.5	258	44.3	<u>258</u>	<u>44.4</u>	257	44.5
450.soplex	250	33.4	<u>251</u>	<u>33.2</u>	253	33.0	250	33.4	<u>251</u>	<u>33.2</u>	253	33.0
453.povray	<u>148</u>	<u>36.0</u>	147	36.2	148	35.9	123	43.1	124	42.8	<u>123</u>	<u>43.1</u>
454.calculix	234	35.3	<u>234</u>	<u>35.3</u>	236	35.0	<u>212</u>	<u>38.9</u>	212	39.0	213	38.8
459.GemsFDTD	87.9	121	84.3	126	<u>85.3</u>	<u>124</u>	<u>78.0</u>	<u>136</u>	79.6	133	77.2	138
465.tonto	<u>394</u>	<u>25.0</u>	404	24.3	356	27.7	272	36.1	<u>270</u>	<u>36.4</u>	270	36.5
470.lbm	<u>63.0</u>	<u>218</u>	69.3	198	60.8	226	<u>63.0</u>	<u>218</u>	69.3	198	60.8	226
481.wrf	229	48.7	<u>236</u>	<u>47.3</u>	238	47.0	229	48.7	<u>236</u>	<u>47.3</u>	238	47.0
482.sphinx3	341	57.2	<u>342</u>	<u>57.0</u>	345	56.5	341	57.2	<u>342</u>	<u>57.0</u>	345	56.5

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"

## Platform Notes

Virtualization Technology disabled  
Execute Disable disabled  
Logical Processor enabled  
System Profile set to Custom  
CPU Power Management set to Maximum Performance  
Memory Frequency set to Maximum Performance  
Turbo Boost enabled  
C1E enabled  
C States enabled  
Monitor/Mwait enabled

Continued on next page



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PowerEdge M820 (Intel Xeon E5-4610 v2, 2.30 GHz)

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**CPU2006 license:** 55

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## Platform Notes (Continued)

```

Memory Patrol Scrub set to disabled
Memory Refresh Rate set to 1x
Memory Operating Voltage set to Auto
Collaborative CPU Performance Control disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on linux Tue Feb 11 06:05:35 2014

```

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see: <http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-4610 v2 @ 2.30GHz
 4 "physical id"s (chips)
 32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
caution.)
  cpu cores : 8
  siblings  : 8
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7
  physical 2: cores 0 1 2 3 4 5 6 7
  physical 3: cores 0 1 2 3 4 5 6 7
cache size : 16384 KB

```

```

From /proc/meminfo
MemTotal:      529392220 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 11 (x86_64)

```

```

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 11 (x86_64)
VERSION = 11
PATCHLEVEL = 3

```

```

uname -a:
Linux linux 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013 (ccab990)
x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Feb 10 22:48 last=S

```

SPEC is set to: /root/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext2  451G  9.4G  440G   3% /

```

Additional information from dmidecode:  
Continued on next page



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## Platform Notes (Continued)

BIOS Dell Inc. 2.0.24 01/21/2014

Memory:

8x 002C04B3002C 36JSF2G72PZ-1G9E1 16 GB 1600 MHz

21x 00CE00B300CE M393B2G70DB0-CMA 16 GB 1600 MHz

3x 00CE04B300CE M393B2G70DB0-CMA 16 GB 1600 MHz

(End of data from sysinfo program)

## General Notes

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

```
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
OMP_NUM_THREADS = "32"
```

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/transparent_hugepage/enabled
```

Filesystem page cache cleared with:

```
echo 1> /proc/sys/vm/drop_caches
```

runspec command invoked through numactl i.e.:

```
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

Continued on next page

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Page 4



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## Base Portability Flags (Continued)

```

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

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



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**Software Availability:** Aug-2013

## 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: basepeak = yes

### 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

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

Continued on next page



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## Peak Optimization Flags (Continued)

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/Dell-Platform-Settings-V1.2-revC.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>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.xml>

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