



# SPEC<sup>®</sup> CFP2006 Result

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## Dell Inc.

PowerEdge M520 (Intel Xeon E5-2403 v2, 1.80 GHz)

SPECfp<sup>®</sup>2006 = **49.9**

SPECfp\_base2006 = **48.5**

CPU2006 license: 55

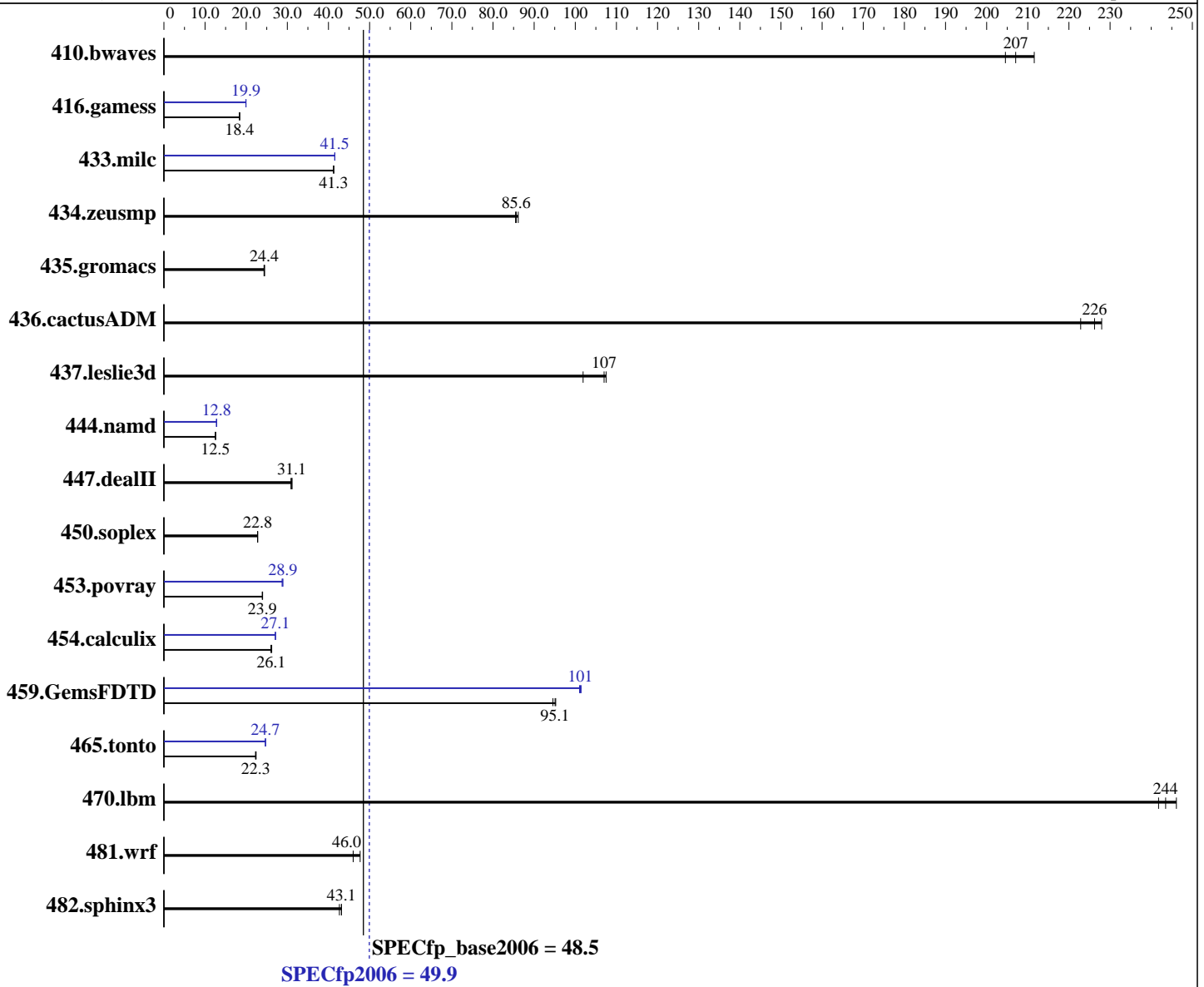
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Nov-2013

Hardware Availability: Jan-2014

Software Availability: Sep-2013



| Hardware             |                                    |
|----------------------|------------------------------------|
| CPU Name:            | Intel Xeon E5-2403 v2              |
| CPU Characteristics: |                                    |
| CPU MHz:             | 1800                               |
| FPU:                 | Integrated                         |
| CPU(s) enabled:      | 8 cores, 2 chips, 4 cores/chip     |
| CPU(s) orderable:    | 2 chip                             |
| 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 (x86_64) 3.0.76-0.11-default  |
| Compiler:         | C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;<br>Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux |
| Auto Parallel:    | Yes   |
| File System:      | ext2  |
| System State:     | Run level 3 (multi-user)  |

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L3 Cache: 10 MB I+D on chip per chip  
Other Cache: None  
Memory: 192 GB (12 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
Disk Subsystem: 1 x 1 TB 7200 RPM SATA  
Other Hardware: None

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    | 66.4        | 205         | <b>65.6</b> | <b>207</b>  | 64.2        | 212         | 66.4        | 205         | <b>65.6</b> | <b>207</b>  | 64.2       | 212         |
| 416.gamess    | 1066        | 18.4        | 1063        | 18.4        | <b>1065</b> | <b>18.4</b> | 983         | 19.9        | 981         | 19.9        | <b>982</b> | <b>19.9</b> |
| 433.milc      | <b>223</b>  | <b>41.3</b> | 223         | 41.3        | 222         | 41.3        | <b>221</b>  | <b>41.5</b> | 221         | 41.5        | 221        | 41.5        |
| 434.zeusmp    | 106         | 86.1        | <b>106</b>  | <b>85.6</b> | 106         | 85.5        | 106         | 86.1        | <b>106</b>  | <b>85.6</b> | 106        | 85.5        |
| 435.gromacs   | <b>292</b>  | <b>24.4</b> | 292         | 24.5        | 293         | 24.3        | <b>292</b>  | <b>24.4</b> | 292         | 24.5        | 293        | 24.3        |
| 436.cactusADM | 53.6        | 223         | <b>52.8</b> | <b>226</b>  | 52.4        | 228         | 53.6        | 223         | <b>52.8</b> | <b>226</b>  | 52.4       | 228         |
| 437.leslie3d  | <b>87.8</b> | <b>107</b>  | 87.4        | 107         | 92.3        | 102         | <b>87.8</b> | <b>107</b>  | 87.4        | 107         | 92.3       | 102         |
| 444.namd      | 639         | 12.5        | 640         | 12.5        | <b>639</b>  | <b>12.5</b> | 626         | 12.8        | <b>627</b>  | <b>12.8</b> | 627        | 12.8        |
| 447.dealII    | 368         | 31.1        | <b>368</b>  | <b>31.1</b> | 370         | 30.9        | 368         | 31.1        | <b>368</b>  | <b>31.1</b> | 370        | 30.9        |
| 450.soplex    | <b>366</b>  | <b>22.8</b> | 366         | 22.8        | 366         | 22.8        | <b>366</b>  | <b>22.8</b> | 366         | 22.8        | 366        | 22.8        |
| 453.povray    | 222         | 24.0        | 223         | 23.9        | <b>222</b>  | <b>23.9</b> | 185         | 28.7        | 184         | 28.9        | <b>184</b> | <b>28.9</b> |
| 454.calculix  | 315         | 26.2        | 317         | 26.0        | <b>316</b>  | <b>26.1</b> | 304         | 27.1        | 304         | 27.1        | <b>304</b> | <b>27.1</b> |
| 459.GemsFDTD  | 112         | 94.6        | <b>112</b>  | <b>95.1</b> | 111         | 95.2        | <b>105</b>  | <b>101</b>  | 105         | 101         | 105        | 101         |
| 465.tonto     | 439         | 22.4        | 441         | 22.3        | <b>441</b>  | <b>22.3</b> | <b>399</b>  | <b>24.7</b> | 398         | 24.7        | 399        | 24.7        |
| 470.lbm       | <b>56.4</b> | <b>244</b>  | 56.8        | 242         | 55.8        | 246         | <b>56.4</b> | <b>244</b>  | 56.8        | 242         | 55.8       | 246         |
| 481.wrf       | 243         | 46.0        | <b>243</b>  | <b>46.0</b> | 234         | 47.7        | 243         | 46.0        | <b>243</b>  | <b>46.0</b> | 234        | 47.7        |
| 482.sphinx3   | 451         | 43.2        | 457         | 42.7        | <b>452</b>  | <b>43.1</b> | 451         | 43.2        | 457         | 42.7        | <b>452</b> | <b>43.1</b> |

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

BIOS settings:  
Virtualization Technology disabled  
Execute Disable disabled  
Logical Processor disabled  
System Profile set to Performance  
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
running on linux Wed Nov 20 19:57:57 2013

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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## Platform Notes (Continued)

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 E5-2403 v2 @ 1.80GHz

2 "physical id"s (chips)

8 "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 : 4

siblings : 4

physical 0: cores 0 1 2 3

physical 1: cores 0 1 2 3

cache size : 10240 KB

From /proc/meminfo

MemTotal: 198443260 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 Nov 20 09:22 last=S

SPEC is set to: /root/cpu2006-1.2

| Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
|------------|------|------|------|-------|------|------------|
| /dev/sda2  | ext2 | 910G | 9.5G | 899G  | 2%   | /          |

Additional information from dmidecode:

BIOS Dell Inc. 2.0.22 09/23/2013

Memory:

12x 00AD04B300AD HMT42GR7AFR4A-PB 16 GB 1333 MHz

(End of data from sysinfo program)



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## 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 = "8"
```

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
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
```



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## 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

## 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:

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[info@spec.org](mailto:info@spec.org)

<http://www.spec.org/>

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## Peak Optimization Flags (Continued)

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

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-revB.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-revB.xml>



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

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