



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>2006 = 72.4

PowerEdge R320 (Intel Xeon E5-2430 v2, 2.50 GHz)

SPECfp\_base2006 = 69.9

CPU2006 license: 55

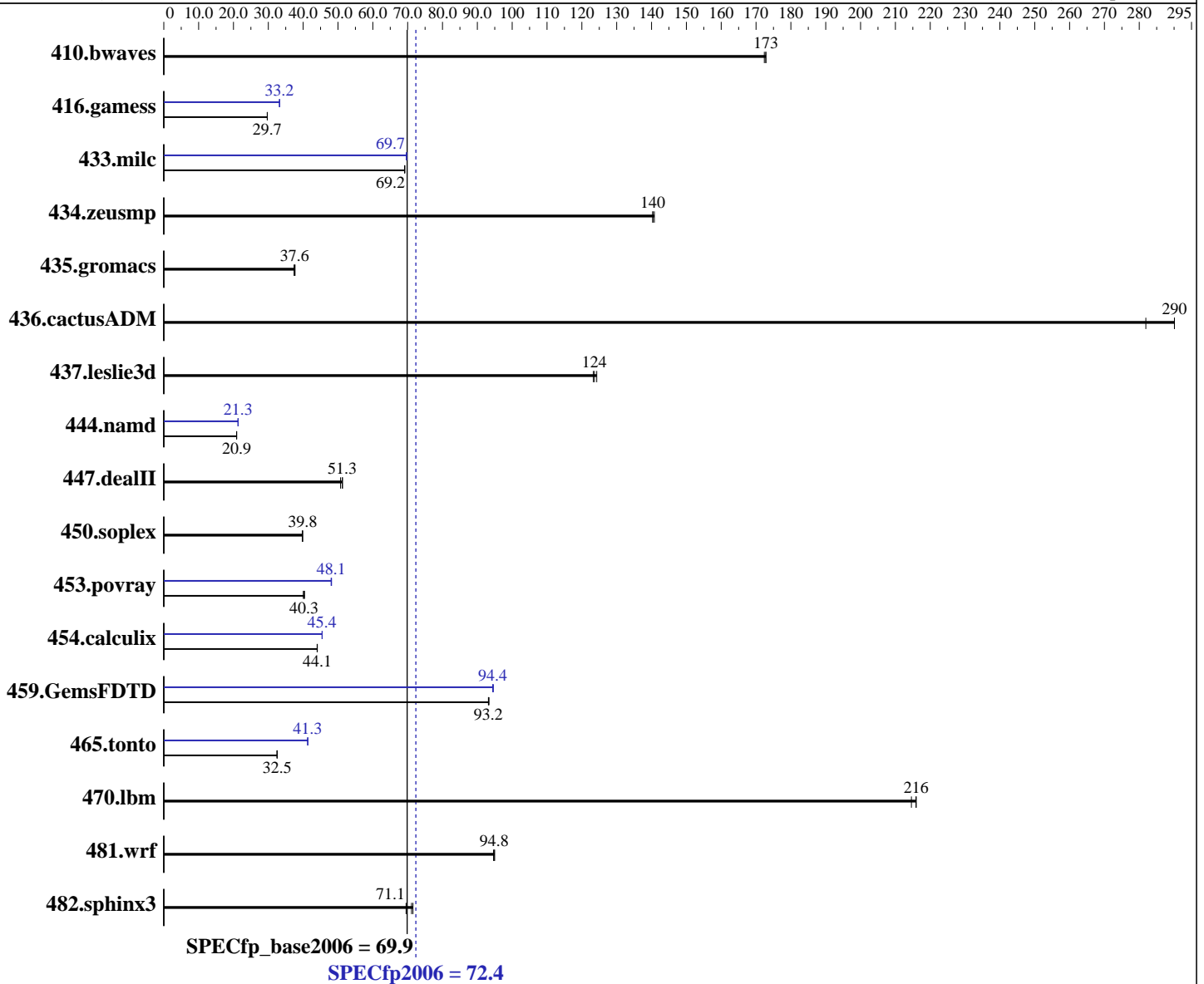
Test date: Oct-2013

Test sponsor: Dell Inc.

Hardware Availability: Jan-2014

Tested by: Dell Inc.

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E5-2430 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 6 cores, 1 chip, 6 cores/chip  
 CPU(s) orderable: 1,2 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;  
 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: 15 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 96 GB (6 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
 Disk Subsystem: 1 x 300 GB 15000 RPM SAS  
 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    | 78.8              | 172                | 78.6               | 173                | <b><u>78.6</u></b> | <b><u>173</u></b>  | 78.8              | 172                | 78.6               | 173                | <b><u>78.6</u></b> | <b><u>173</u></b>  |
| 416.gamess    | 659               | 29.7               | <b><u>659</u></b>  | <b><u>29.7</u></b> | 659                | 29.7               | 589               | 33.3               | 590                | 33.2               | <b><u>590</u></b>  | <b><u>33.2</u></b> |
| 433.milc      | 133               | 69.1               | <b><u>133</u></b>  | <b><u>69.2</u></b> | 133                | 69.2               | <b><u>132</u></b> | <b><u>69.7</u></b> | 132                | 69.6               | 132                | 69.7               |
| 434.zeusmp    | 64.6              | 141                | <b><u>64.8</u></b> | <b><u>140</u></b>  | 64.8               | 140                | 64.6              | 141                | <b><u>64.8</u></b> | <b><u>140</u></b>  | 64.8               | 140                |
| 435.gromacs   | 190               | 37.7               | <b><u>190</u></b>  | <b><u>37.6</u></b> | 191                | 37.4               | 190               | 37.7               | <b><u>190</u></b>  | <b><u>37.6</u></b> | 191                | 37.4               |
| 436.cactusADM | 42.4              | 282                | 41.2               | 290                | <b><u>41.2</u></b> | <b><u>290</u></b>  | 42.4              | 282                | 41.2               | 290                | <b><u>41.2</u></b> | <b><u>290</u></b>  |
| 437.leslie3d  | 75.6              | 124                | 76.2               | 123                | <b><u>76.0</u></b> | <b><u>124</u></b>  | 75.6              | 124                | 76.2               | 123                | <b><u>76.0</u></b> | <b><u>124</u></b>  |
| 444.namd      | <b><u>384</u></b> | <b><u>20.9</u></b> | 384                | 20.9               | 384                | 20.9               | <b><u>376</u></b> | <b><u>21.3</u></b> | 376                | 21.3               | 376                | 21.3               |
| 447.dealII    | 226               | 50.7               | 223                | 51.3               | <b><u>223</u></b>  | <b><u>51.3</u></b> | 226               | 50.7               | 223                | 51.3               | <b><u>223</u></b>  | <b><u>51.3</u></b> |
| 450.soplex    | 209               | 39.8               | 210                | 39.8               | <b><u>209</u></b>  | <b><u>39.8</u></b> | 209               | 39.8               | 210                | 39.8               | <b><u>209</u></b>  | <b><u>39.8</u></b> |
| 453.povray    | 133               | 40.0               | <b><u>132</u></b>  | <b><u>40.3</u></b> | 132                | 40.4               | <b><u>111</u></b> | <b><u>48.1</u></b> | 110                | 48.2               | 111                | 48.1               |
| 454.calculix  | <b><u>187</u></b> | <b><u>44.1</u></b> | 187                | 44.0               | 187                | 44.1               | 182               | 45.5               | 182                | 45.4               | <b><u>182</u></b>  | <b><u>45.4</u></b> |
| 459.GemsFDTD  | 114               | 93.4               | <b><u>114</u></b>  | <b><u>93.2</u></b> | 114                | 93.2               | <b><u>112</u></b> | <b><u>94.4</u></b> | 112                | 94.6               | 112                | 94.4               |
| 465.tonto     | <b><u>302</u></b> | <b><u>32.5</u></b> | 302                | 32.6               | 303                | 32.5               | <b><u>238</u></b> | <b><u>41.3</u></b> | 238                | 41.3               | 238                | 41.3               |
| 470.lbm       | 64.0              | 215                | <b><u>63.6</u></b> | <b><u>216</u></b>  | 63.6               | 216                | 64.0              | 215                | <b><u>63.6</u></b> | <b><u>216</u></b>  | 63.6               | 216                |
| 481.wrf       | 118               | 95.0               | 118                | 94.7               | <b><u>118</u></b>  | <b><u>94.8</u></b> | 118               | 95.0               | 118                | 94.7               | <b><u>118</u></b>  | <b><u>94.8</u></b> |
| 482.sphinx3   | 273               | 71.5               | <b><u>274</u></b>  | <b><u>71.1</u></b> | 280                | 69.5               | 273               | 71.5               | <b><u>274</u></b>  | <b><u>71.1</u></b> | 280                | 69.5               |

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

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 Oct 16 01:10:08 2013

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CPU2006 license: 55

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## Platform Notes (Continued)

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 E5-2430 v2 @ 2.50GHz
 1 "physical id"s (chips)
 6 "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 : 6
  siblings  : 6
  physical 0: cores 0 1 2 3 4 5
cache size : 15360 KB

```

```

From /proc/meminfo
MemTotal:      99123704 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 Oct 15 18:50 last=S

```

SPEC is set to: /root/cpu2006-1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext2  267G  9.4G  257G   4% /

```

```

Additional information from dmidecode:
BIOS Dell Inc. 2.0.21 09/23/2013
Memory:
6x 00CE00B300CE M393B2G70BH0-YK0 16 GB 1600 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 = "6"
```

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/redhat_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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## 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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