



# SPEC® CFP2006 Result

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Dell Inc.

SPECfp®2006 = 54.1

PowerEdge T320 (Intel Xeon E5-2407 v2, 2.40 GHz)

SPECfp\_base2006 = 53.0

CPU2006 license: 55

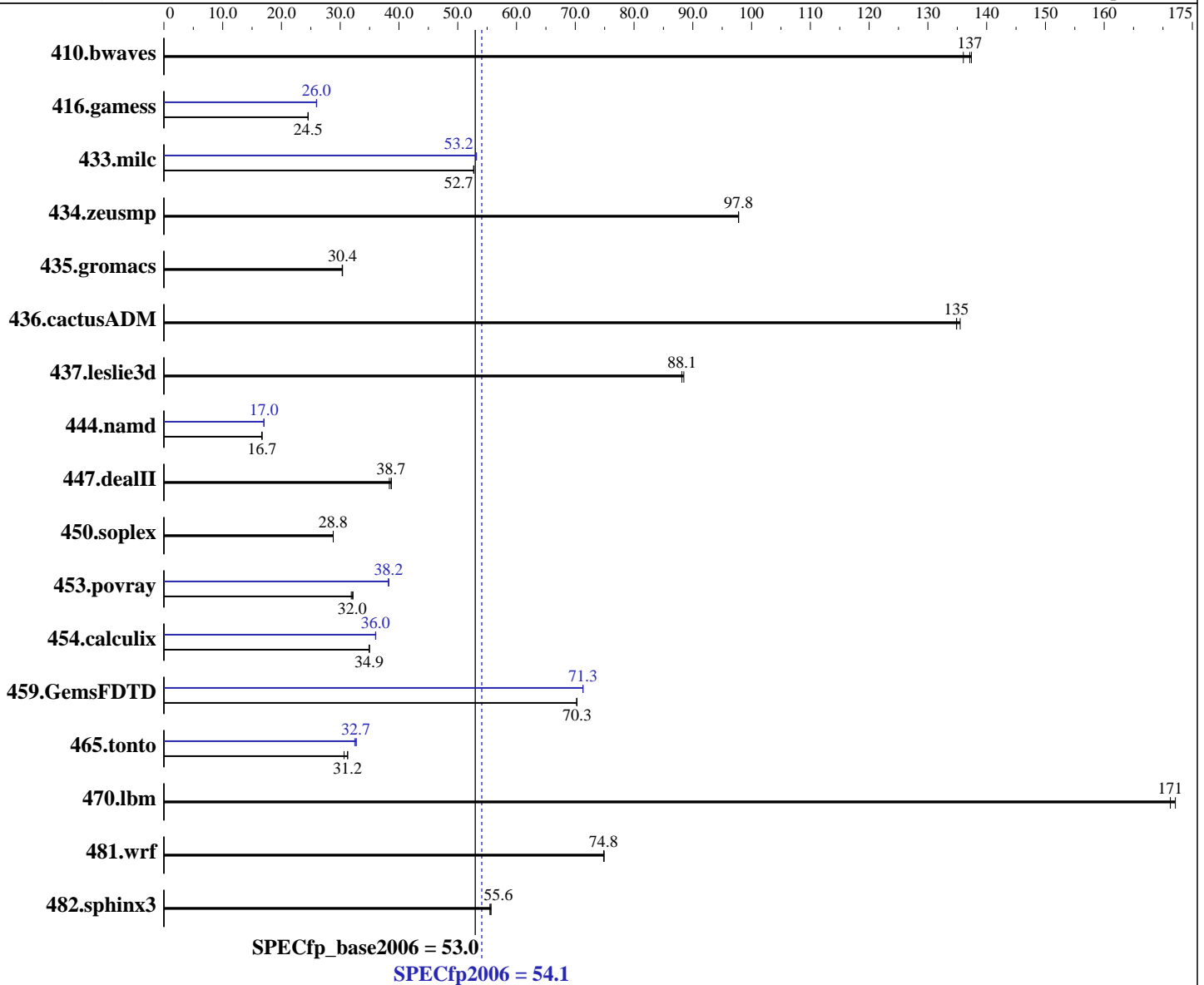
Test date: Nov-2013

Test sponsor: Dell Inc.

Hardware Availability: Jan-2014

Tested by: Dell Inc.

Software Availability: Sep-2013



## Hardware

CPU Name: Intel Xeon E5-2407 v2  
 CPU Characteristics:  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 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: Red Hat Enterprise Linux server release 6.4  
 2.6.32-358.el6.x86\_64  
 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: ext4  
 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: 96 GB (6 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
 Disk Subsystem: 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	99.9	136	<b><u>99.1</u></b>	<b><u>137</u></b>	98.9	137	99.9	136	<b><u>99.1</u></b>	<b><u>137</u></b>	98.9	137
416.gamess	799	24.5	797	24.6	<b><u>798</u></b>	<b><u>24.5</u></b>	<b><u>754</u></b>	<b><u>26.0</u></b>	753	26.0	754	26.0
433.milc	<b><u>174</u></b>	<b><u>52.7</u></b>	174	52.7	174	52.7	<b><u>173</u></b>	<b><u>53.2</u></b>	173	53.2	173	53.2
434.zeusmp	93.1	97.8	<b><u>93.1</u></b>	<b><u>97.8</u></b>	93.1	97.8	93.1	97.8	<b><u>93.1</u></b>	<b><u>97.8</u></b>	93.1	97.8
435.gromacs	<b><u>235</u></b>	<b><u>30.4</u></b>	235	30.3	235	30.4	<b><u>235</u></b>	<b><u>30.4</u></b>	235	30.3	235	30.4
436.cactusADM	<b><u>88.6</u></b>	<b><u>135</u></b>	88.2	135	88.6	135	<b><u>88.6</u></b>	<b><u>135</u></b>	88.2	135	88.6	135
437.leslie3d	<b><u>107</u></b>	<b><u>88.1</u></b>	107	88.1	106	88.5	<b><u>107</u></b>	<b><u>88.1</u></b>	107	88.1	106	88.5
444.namd	481	16.7	<b><u>481</u></b>	<b><u>16.7</u></b>	481	16.7	<b><u>471</u></b>	<b><u>17.0</u></b>	471	17.0	471	17.0
447.dealII	296	38.7	298	38.4	<b><u>296</u></b>	<b><u>38.7</u></b>	296	38.7	298	38.4	<b><u>296</u></b>	<b><u>38.7</u></b>
450.soplex	289	28.8	290	28.8	<b><u>289</u></b>	<b><u>28.8</u></b>	289	28.8	290	28.8	<b><u>289</u></b>	<b><u>28.8</u></b>
453.povray	167	31.9	<b><u>166</u></b>	<b><u>32.0</u></b>	165	32.2	139	38.3	<b><u>139</u></b>	<b><u>38.2</u></b>	139	38.2
454.calculix	236	35.0	236	34.9	<b><u>236</u></b>	<b><u>34.9</u></b>	<b><u>229</u></b>	<b><u>36.0</u></b>	229	36.0	229	36.1
459.GemsFDTD	151	70.3	151	70.2	<b><u>151</u></b>	<b><u>70.3</u></b>	149	71.3	149	71.3	<b><u>149</u></b>	<b><u>71.3</u></b>
465.tonto	<b><u>315</u></b>	<b><u>31.2</u></b>	321	30.7	315	31.3	303	32.5	301	32.7	<b><u>301</u></b>	<b><u>32.7</u></b>
470.lbm	79.8	172	<b><u>80.2</u></b>	<b><u>171</u></b>	80.2	171	79.8	172	<b><u>80.2</u></b>	<b><u>171</u></b>	80.2	171
481.wrf	149	74.9	149	74.8	<b><u>149</u></b>	<b><u>74.8</u></b>	149	74.9	149	74.8	<b><u>149</u></b>	<b><u>74.8</u></b>
482.sphinx3	350	55.7	<b><u>350</u></b>	<b><u>55.6</u></b>	351	55.5	350	55.7	<b><u>350</u></b>	<b><u>55.6</u></b>	351	55.5

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  
 System Profile set to Performance  
 Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818  
 \$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
 running on root Tue Nov 5 16:14:15 2013

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

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## Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) CPU E5-2407 v2 @ 2.40GHz
1 "physical id"s (chips)
4 "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
cache size : 10240 KB
```

From /proc/meminfo

```
MemTotal: 98991332 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

/usr/bin/lsb\_release -d

```
Red Hat Enterprise Linux Server release 6.4 (Santiago)
```

From /etc/\*release\* /etc/\*version\*

```
redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

uname -a:

```
Linux root 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013 x86_64
x86_64 x86_64 GNU/Linux
```

run-level 3 Nov 5 08:23

SPEC is set to: /root/cpu2006-1.2

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext4 271G 12G 246G 5% /
```

Additional information from dmidecode:

```
BIOS Dell Inc. 2.0.21 09/23/2013
```

```
Memory:
```

```
6x 00AD00B300AD HMT42GR7MFR4A-PB 16 GB 1333 MHz 2 rank
```

(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 = "4"
```

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB

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## General Notes (Continued)

memory using RedHat EL 6.4  
Transparent Huge Pages disabled with:  
echo never > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled  
Filesystem page cache cleared with:  
echo 1> /proc/sys/vm/drop\_caches

## 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:

-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

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## Base Optimization Flags (Continued)

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:

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

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## Peak Optimization Flags (Continued)

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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