



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>2006 = 113

PowerEdge R920 (Intel Xeon E7-8891 v2, 3.20 GHz)

SPECfp\_base2006 = 107

CPU2006 license: 55

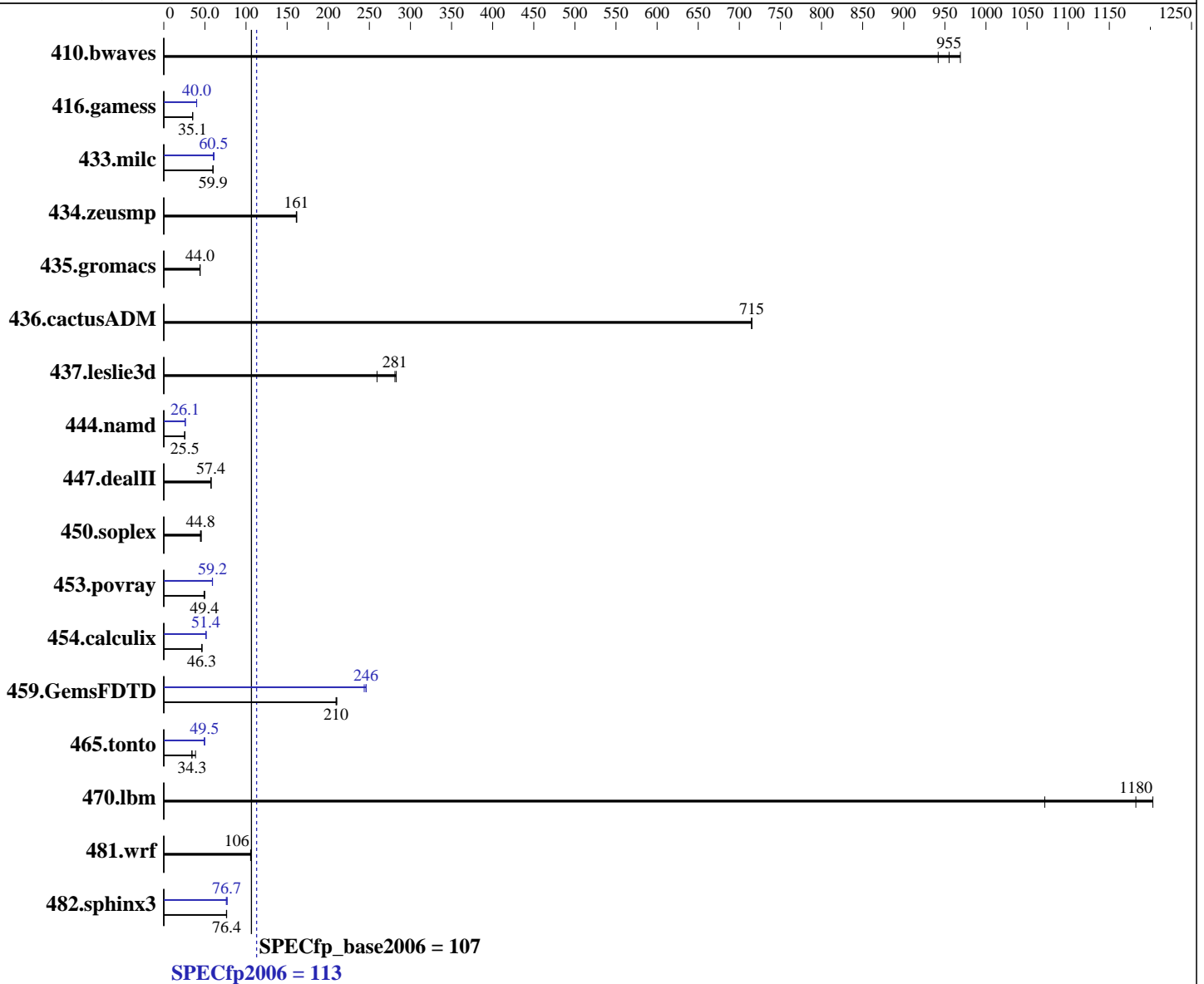
Test date: Feb-2014

Test sponsor: Dell Inc.

Hardware Availability: Mar-2014

Tested by: Dell Inc.

Software Availability: Mar-2014



### Hardware

CPU Name: Intel Xeon E7-8891 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 3200  
 FPU: Integrated  
 CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 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)  
 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)

Continued on next page



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L3 Cache: 37.5 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 1 TB (64 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
 Disk Subsystem: 1 x 400 GB SAS6 SSD  
 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	14.0	969	<u>14.2</u>	<u>955</u>	14.4	942	14.0	969	<u>14.2</u>	<u>955</u>	14.4	942
416.gamess	559	35.0	<u>558</u>	<u>35.1</u>	557	35.1	<u>490</u>	<u>40.0</u>	489	40.0	490	40.0
433.milc	154	59.7	<u>153</u>	<u>59.9</u>	153	60.0	152	60.4	<u>152</u>	<u>60.5</u>	150	61.2
434.zeusmp	56.2	162	56.4	161	<u>56.4</u>	<u>161</u>	56.2	162	56.4	161	<u>56.4</u>	<u>161</u>
435.gromacs	162	44.0	161	44.3	<u>162</u>	<u>44.0</u>	162	44.0	161	44.3	<u>162</u>	<u>44.0</u>
436.cactusADM	16.7	715	<u>16.7</u>	<u>715</u>	16.7	715	16.7	715	<u>16.7</u>	<u>715</u>	16.7	715
437.leslie3d	36.2	259	33.2	283	<u>33.4</u>	<u>281</u>	36.2	259	33.2	283	<u>33.4</u>	<u>281</u>
444.namd	315	25.5	315	25.5	<u>315</u>	<u>25.5</u>	308	26.1	308	26.1	<u>308</u>	<u>26.1</u>
447.dealII	<u>199</u>	<u>57.4</u>	200	57.3	198	57.6	<u>199</u>	<u>57.4</u>	200	57.3	198	57.6
450.soplex	183	45.7	<u>186</u>	<u>44.8</u>	187	44.7	183	45.7	<u>186</u>	<u>44.8</u>	187	44.7
453.povray	<u>108</u>	<u>49.4</u>	107	49.8	109	48.9	89.8	59.3	90.1	59.1	<u>89.9</u>	<u>59.2</u>
454.calculix	<u>178</u>	<u>46.3</u>	178	46.3	178	46.4	<u>161</u>	<u>51.4</u>	160	51.5	161	51.3
459.GemsFDTD	50.6	210	<u>50.6</u>	<u>210</u>	50.4	210	<u>43.1</u>	<u>246</u>	43.5	244	43.1	246
465.tonto	288	34.2	<u>287</u>	<u>34.3</u>	255	38.6	<u>199</u>	<u>49.5</u>	198	49.7	200	49.1
470.lbm	<u>11.6</u>	<u>1180</u>	11.4	1200	12.8	1070	<u>11.6</u>	<u>1180</u>	11.4	1200	12.8	1070
481.wrf	106	106	<u>106</u>	<u>106</u>	105	106	106	106	<u>106</u>	<u>106</u>	105	106
482.sphinx3	<u>255</u>	<u>76.4</u>	256	76.2	255	76.5	<u>254</u>	<u>76.7</u>	253	77.1	256	76.0

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 Custom  
 ClE enabled  
 C States enabled  
 Memory Patrol Scrub set to disabled  
 Sysinfo program  
 /root/Desktop/Performance/ic14.0\_Oct17\_2013/config/sysinfo.rev6818  
 \$Rev: 6818 \$ \$Date:: 2012-07-17 # \$ e86d102572650a6e4d596a3cee98f191

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## Platform Notes (Continued)

running on slesperf3 Fri Feb 7 03:04:56 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 E7-8891 v2 @ 3.20GHz
 4 "physical id"s (chips)
 80 "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 : 10
  siblings  : 20
  physical 0: cores 2 3 4 5 6 7 8 10 11 12
  physical 1: cores 2 3 4 5 6 7 8 10 11 12
  physical 2: cores 2 3 4 5 6 7 8 10 11 12
  physical 3: cores 2 3 4 5 6 7 8 10 11 12
cache size : 38400 KB

```

From /proc/meminfo

```

MemTotal:      1058789108 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 slesperf3 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 6 09:45 last=S

SPEC is set to: /root/Desktop/Performance/ic14.0\_Oct17\_2013

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext2  365G  236G  128G   65% /

```

Additional information from dmidecode:

BIOS Dell Inc. 1.0.4 01/27/2014

Memory:

```

31x 00CE00B300CE M393B2G70BH0-YK0 16 GB 1333 MHz
19x 00CE00B300CE M393B2G70CB0-YK0 16 GB 1333 MHz
8x 00CE04B300CE M393B2G70BH0-YK0 16 GB 1333 MHz
6x 00CE04B300CE M393B2G70CB0-YK0 16 GB 1333 MHz

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## Platform Notes (Continued)

(End of data from sysinfo program)

## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact,1,0"

LD\_LIBRARY\_PATH = \*/root/Desktop/Performance/icl4.0\_Oct17\_2013/libs/32:/root/Desktop/Performance/icl4.0\_Oct17\_2013/libs/64:/root/Desktop/Performance/icl4.0\_Oct17\_2013/sh\*

OMP\_NUM\_THREADS = "40"

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

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

Continued on next page



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## Base Portability Flags (Continued)

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

## Peak Optimization Flags

C benchmarks:

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## Peak Optimization Flags (Continued)

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: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel

### 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.dealII: 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

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## Peak Optimization Flags (Continued)

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

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