



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>2006 = 82.9

PowerEdge R920 (Intel Xeon E7-4830 v2, 2.20 GHz)

SPECfp\_base2006 = 78.4

CPU2006 license: 55

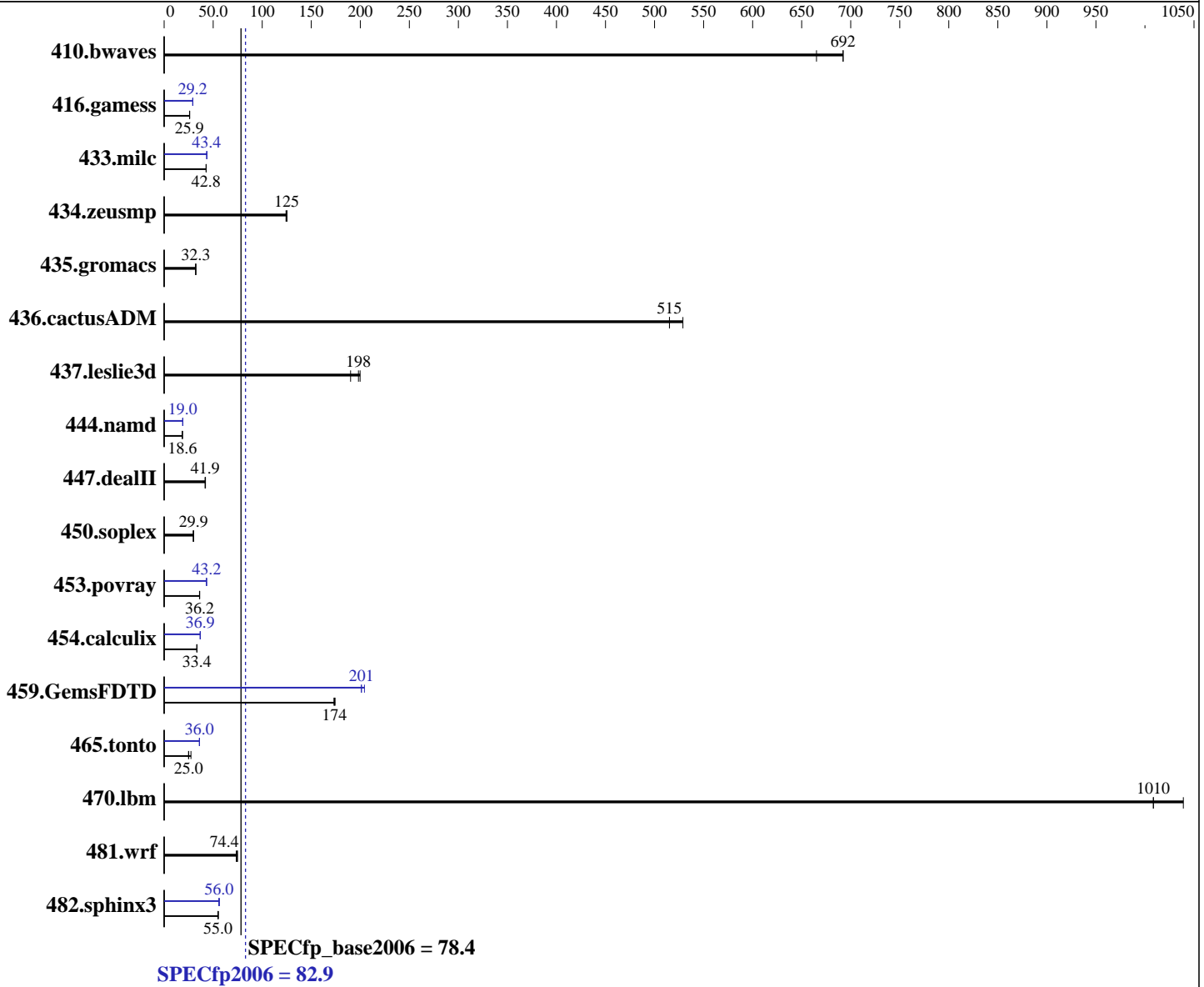
Test date: Sep-2014

Test sponsor: Dell Inc.

Hardware Availability: Mar-2014

Tested by: Dell Inc.

Software Availability: May-2014



### Hardware

CPU Name: Intel Xeon E7-4830 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz  
 CPU MHz: 2200  
 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

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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: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 1 TB (64 x 16 GB 2Rx4 PC3-12800R-11, ECC, running at 1066 MHz)  
Disk Subsystem: 1 x 400 GB SAS SSD 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	20.4	665	<b>19.6</b>	<b>692</b>	19.6	692	20.4	665	<b>19.6</b>	<b>692</b>	19.6	692
416.gamess	750	26.1	<b>756</b>	<b>25.9</b>	756	25.9	<b>670</b>	<b>29.2</b>	671	29.2	669	29.3
433.milc	214	42.8	214	42.8	<b>214</b>	<b>42.8</b>	210	43.7	<b>211</b>	<b>43.4</b>	211	43.4
434.zeusmp	<b>72.9</b>	<b>125</b>	73.3	124	72.7	125	<b>72.9</b>	<b>125</b>	73.3	124	72.7	125
435.gromacs	<b>221</b>	<b>32.3</b>	223	32.1	221	32.3	<b>221</b>	<b>32.3</b>	223	32.1	221	32.3
436.cactusADM	<b>23.2</b>	<b>515</b>	23.2	515	22.6	529	<b>23.2</b>	<b>515</b>	23.2	515	22.6	529
437.leslie3d	47.0	200	<b>47.4</b>	<b>198</b>	49.4	190	47.0	200	<b>47.4</b>	<b>198</b>	49.4	190
444.namd	<b>432</b>	<b>18.6</b>	432	18.6	431	18.6	<b>422</b>	<b>19.0</b>	422	19.0	422	19.0
447.dealII	274	41.8	271	42.1	<b>273</b>	<b>41.9</b>	274	41.8	271	42.1	<b>273</b>	<b>41.9</b>
450.soplex	281	29.7	<b>279</b>	<b>29.9</b>	278	30.0	281	29.7	<b>279</b>	<b>29.9</b>	278	30.0
453.povray	147	36.2	<b>147</b>	<b>36.2</b>	148	36.0	<b>123</b>	<b>43.2</b>	123	43.3	123	43.1
454.calculix	<b>247</b>	<b>33.4</b>	248	33.3	246	33.6	224	36.9	<b>224</b>	<b>36.9</b>	225	36.7
459.GemsFDTD	60.9	174	61.3	173	<b>61.1</b>	<b>174</b>	52.0	204	52.8	201	<b>52.8</b>	<b>201</b>
465.tonto	360	27.3	395	24.9	<b>393</b>	<b>25.0</b>	273	36.0	273	36.0	<b>273</b>	<b>36.0</b>
470.lbm	13.2	1040	13.6	1010	<b>13.6</b>	<b>1010</b>	13.2	1040	13.6	1010	<b>13.6</b>	<b>1010</b>
481.wrf	<b>150</b>	<b>74.4</b>	152	73.5	149	74.8	<b>150</b>	<b>74.4</b>	152	73.5	149	74.8
482.sphinx3	356	54.8	<b>354</b>	<b>55.0</b>	352	55.3	346	56.3	<b>348</b>	<b>56.0</b>	350	55.8

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  
CPU Power Management set to Maximum Performance  
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 Mon Sep 15 04:57:40 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 E7-4830 v2 @ 2.20GHz
 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 0 1 2 3 4 8 9 10 11 12
 physical 1: cores 0 1 2 3 4 8 9 10 11 12
 physical 2: cores 0 1 2 3 4 8 9 10 11 12
 physical 3: cores 0 1 2 3 4 8 9 10 11 12
cache size : 20480 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 Sep 15 09:25 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  260G  104G  72% /

```

Additional information from dmidecode:

```

BIOS Dell Inc. 1.2.2 05/05/2014
Memory:
 64x 00CE00B300CE M393B2G70BH0-YK0 16 GB 1066 MHz

```

(End of data from sysinfo program)



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## 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/ic14.0\_Oct17\_2013/libs/32:/root/Desktop/Performance/ic14.0\_Oct17\_2013/libs/64:/root/Desktop/Performance/ic14.0\_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.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



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

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## Peak Optimization Flags (Continued)

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

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-revC.html>

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

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



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

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