



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp<sup>®</sup>2006 = 127

PowerEdge R630 (Intel Xeon E5-2667 v4, 3.20 GHz)

SPECfp\_base2006 = 123

CPU2006 license: 55

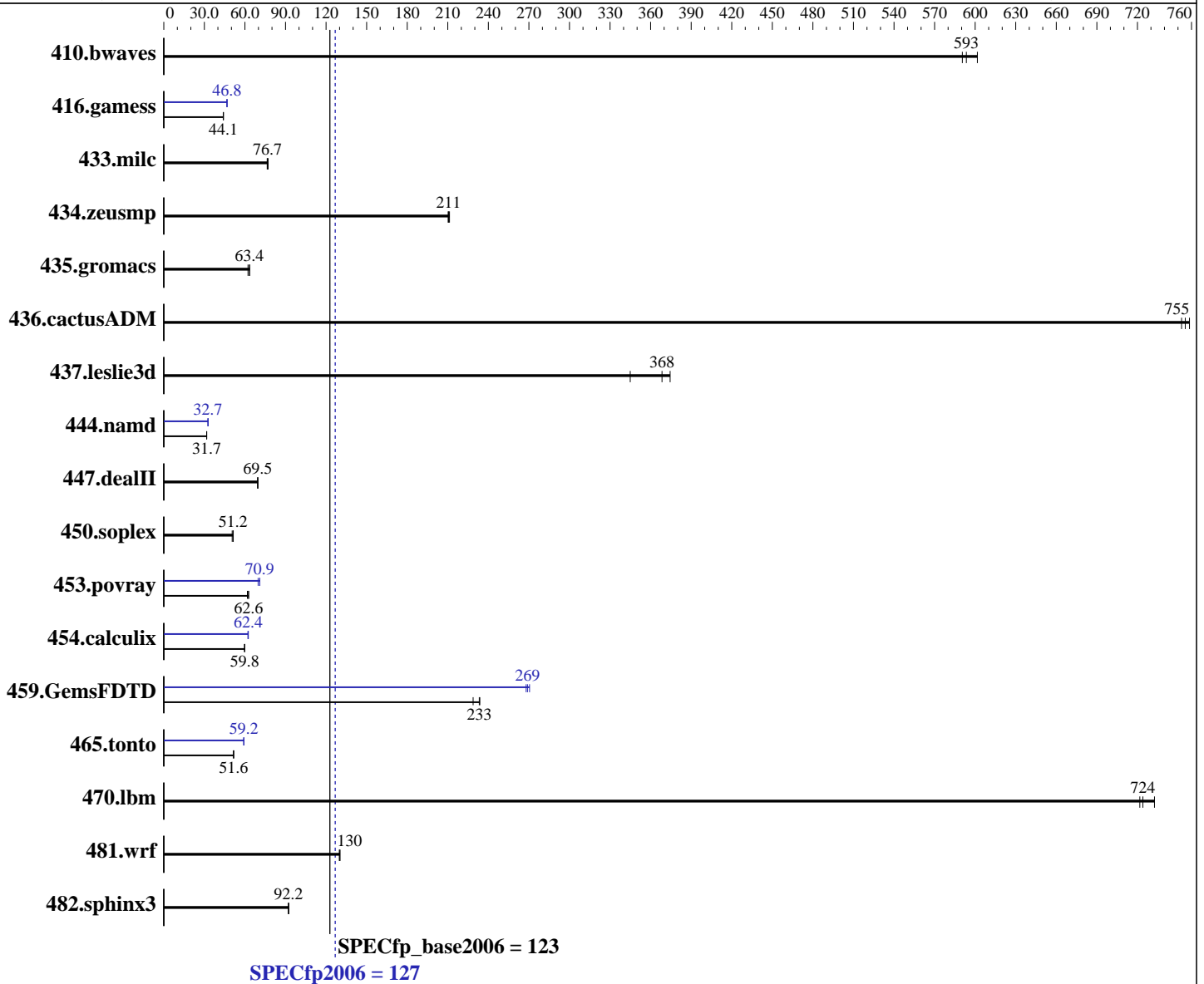
Test date: Mar-2016

Test sponsor: Dell Inc.

Hardware Availability: Mar-2016

Tested by: Dell Inc.

Software Availability: Mar-2016



## Hardware

CPU Name: Intel Xeon E5-2667 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 3200  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core  
 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 12 SP1 3.12.49-11-default  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 25 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)  
 Disk Subsystem: 1 x 480 GB SATA 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	22.6	602	23.0	591	<u>22.9</u>	<u>593</u>	22.6	602	23.0	591	<u>22.9</u>	<u>593</u>
416.gamess	445	44.0	<u>444</u>	<u>44.1</u>	444	44.1	419	46.7	<u>419</u>	<u>46.8</u>	419	46.8
433.milc	120	76.4	<u>120</u>	<u>76.7</u>	119	77.1	120	76.4	<u>120</u>	<u>76.7</u>	119	77.1
434.zeusmp	<u>43.2</u>	<u>211</u>	43.3	210	43.1	211	<u>43.2</u>	<u>211</u>	43.3	210	43.1	211
435.gromacs	<u>113</u>	<u>63.4</u>	115	62.3	113	63.4	<u>113</u>	<u>63.4</u>	115	62.3	113	63.4
436.cactusADM	15.8	758	15.9	753	<u>15.8</u>	<u>755</u>	15.8	758	15.9	753	<u>15.8</u>	<u>755</u>
437.leslie3d	27.3	345	25.1	374	<u>25.5</u>	<u>368</u>	27.3	345	25.1	374	<u>25.5</u>	<u>368</u>
444.namd	253	31.7	253	31.7	<u>253</u>	<u>31.7</u>	<u>245</u>	<u>32.7</u>	245	32.7	245	32.7
447.dealII	<u>165</u>	<u>69.5</u>	164	69.6	165	69.4	<u>165</u>	<u>69.5</u>	164	69.6	165	69.4
450.soplex	162	51.4	<u>163</u>	<u>51.2</u>	165	50.6	162	51.4	<u>163</u>	<u>51.2</u>	165	50.6
453.povray	<u>84.9</u>	<u>62.6</u>	86.1	61.8	84.8	62.7	76.3	69.7	<u>75.0</u>	<u>70.9</u>	75.0	71.0
454.calculix	138	59.7	138	59.8	<u>138</u>	<u>59.8</u>	132	62.5	133	62.2	<u>132</u>	<u>62.4</u>
459.GemsFDTD	45.4	234	<u>45.5</u>	<u>233</u>	46.4	229	<u>39.4</u>	<u>269</u>	39.6	268	39.2	270
465.tonto	191	51.6	<u>191</u>	<u>51.6</u>	190	51.7	<u>166</u>	<u>59.2</u>	166	59.2	166	59.1
470.lbm	<u>19.0</u>	<u>724</u>	19.0	722	18.8	733	<u>19.0</u>	<u>724</u>	19.0	722	18.8	733
481.wrf	85.7	130	86.0	130	<u>86.0</u>	<u>130</u>	85.7	130	86.0	130	<u>86.0</u>	<u>130</u>
482.sphinx3	211	92.4	211	92.2	<u>211</u>	<u>92.2</u>	211	92.4	211	92.2	<u>211</u>	<u>92.2</u>

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:  
 Snoop Mode set to Opportunistic Snoop Broadcast  
 Virtualization Technology disabled  
 CPU Power Management set to Maximum Performance  
 Memory Patrol Scrub disabled  
 C states set to Autonomous  
 Energy Efficient Policy set to Performance  
 Energy Efficient Turbo disabled  
 C1E disabled  
 Uncore Frequency set to Dynamic

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## Platform Notes (Continued)

```

Logical Processor enabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 # $ e3fbb8667b5a285932ceab81e28219e1
running on linux-m662 Thu Mar 17 20:51:33 2016

```

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 E5-2667 v4@ 3.20GHz
 2 "physical id"s (chips)
 32 "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 : 8
siblings : 16
physical 0: cores 0 2 3 4 8 10 11 12
physical 1: cores 0 2 3 4 8 10 11 12
cache size : 25600 KB

```

```

From /proc/meminfo
MemTotal:      529333472 kB
HugePages_Total:    0
Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP1

```

```

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
# This file is deprecated and will be removed in a future service pack or
release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"

```

```

uname -a:
Linux linux-m662 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Mar 17 16:04

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## Platform Notes (Continued)

SPEC is set to: /root/cpu2006-1.2

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	xf	439G	9.1G	430G	3%	/

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Dell Inc. 2.0.1 02/12/2016

Memory:

16x 00AD063200AD HMA84GR7MFR4N-UH 32 GB 2 rank 2400 MHz  
8x Not Specified Not Specified

(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/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

OMP\_NUM\_THREADS = "16"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/transparent\_hugepage/enabled

## 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



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## 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

```

## Base Optimization Flags

```

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -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

```

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Software Availability: Mar-2016

## Peak Compiler Invocation (Continued)

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: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias  
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4  
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

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## Peak Optimization Flags (Continued)

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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: -xCORE-AVX2 -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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.xml>

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