





# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Dell Inc.

SPECfp2006 = 118

PowerEdge R930 (Intel Xeon E7-8893 v4, 3.20 GHz)

SPECfp\_base2006 = 113

CPU2006 license: 55

Test date: May-2016

Test sponsor: Dell Inc.

Hardware Availability: Jun-2016

Tested by: Dell Inc.

Software Availability: Dec-2015

L3 Cache: 60 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)  
 Disk Subsystem: 1 x 480 GB SAS 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	<b>17.2</b>	<b>790</b>	17.1	793	17.2	788	<b>17.2</b>	<b>790</b>	17.1	793	17.2	788
416.gamess	<b>490</b>	<b>39.9</b>	490	40.0	491	39.9	<b>421</b>	<b>46.6</b>	420	46.6	421	46.5
433.milc	<b>134</b>	<b>68.5</b>	132	69.7	137	66.8	<b>134</b>	<b>68.5</b>	132	69.7	137	66.8
434.zeusmp	51.4	177	<b>51.1</b>	<b>178</b>	51.0	178	51.4	177	<b>51.1</b>	<b>178</b>	51.0	178
435.gromacs	<b>125</b>	<b>57.1</b>	125	57.2	125	57.0	<b>125</b>	<b>57.1</b>	125	57.2	125	57.0
436.cactusADM	16.8	710	<b>16.9</b>	<b>706</b>	17.0	702	16.8	710	<b>16.9</b>	<b>706</b>	17.0	702
437.leslie3d	<b>25.3</b>	<b>372</b>	25.2	373	25.6	367	<b>25.3</b>	<b>372</b>	25.2	373	25.6	367
444.namd	261	30.8	261	30.7	<b>261</b>	<b>30.8</b>	253	31.7	<b>253</b>	<b>31.7</b>	258	31.1
447.dealII	179	63.9	178	64.3	<b>178</b>	<b>64.2</b>	179	63.9	178	64.3	<b>178</b>	<b>64.2</b>
450.soplex	183	45.6	<b>183</b>	<b>45.5</b>	183	45.5	183	45.6	<b>183</b>	<b>45.5</b>	183	45.5
453.povray	84.3	63.1	<b>85.6</b>	<b>62.1</b>	86.2	61.7	75.8	70.2	<b>75.7</b>	<b>70.3</b>	74.1	71.8
454.calculix	150	55.0	150	54.9	<b>150</b>	<b>55.0</b>	<b>137</b>	<b>60.1</b>	137	60.3	139	59.2
459.GemsFDTD	<b>53.6</b>	<b>198</b>	55.5	191	53.2	199	<b>45.7</b>	<b>232</b>	46.7	227	45.5	233
465.tonto	213	46.3	214	46.0	<b>213</b>	<b>46.2</b>	170	58.0	<b>169</b>	<b>58.1</b>	169	58.2
470.lbm	18.5	742	<b>18.6</b>	<b>740</b>	18.8	731	18.5	742	<b>18.6</b>	<b>740</b>	18.8	731
481.wrf	131	85.1	<b>131</b>	<b>85.2</b>	130	85.6	131	85.1	<b>131</b>	<b>85.2</b>	130	85.6
482.sphinx3	243	80.1	245	79.4	<b>244</b>	<b>79.9</b>	243	80.1	245	79.4	<b>244</b>	<b>79.9</b>

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  
 System Profile set to Custom  
 CPU Power Management set to Hardware P States  
 Memory Frequency set to Maximum Performance  
 Turbo Boost Enabled  
 Energy Efficient Turbo Enabled  
 C1E Disabled  
 C States set to Autonomous

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## Platform Notes (Continued)

Collaborative CPU Performance Control Disabled  
 Memory Patrol Scrub Disabled  
 Memory Refresh Rate set to 1x  
 Uncore Frequency set to Dynamic  
 Energy Efficient Policy set to Performance  
 Monitor/MWait Enabled  
 Snoop Mode set to Home Snoop  
 Sysinfo program /root/icl6.0\_Sept12\_2015/config/sysinfo.rev6914  
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
 running on bdx-perfspeed Fri May 6 14:28:02 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 E7-8893 v4 @ 3.20GHz
 4 "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    : 4
  siblings     : 8
  physical 0: cores 12 13 25 26
  physical 1: cores 12 13 25 26
  physical 2: cores 12 13 25 26
  physical 3: cores 12 13 25 26
cache size     : 61440 KB
```

```
From /proc/meminfo
MemTotal:      529318708 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"
```

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## Platform Notes (Continued)

```
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

```
uname -a:
Linux bdx-perfspeed 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 May 6 09:38
```

```
SPEC is set to: /root/ic16.0_Sept12_2015
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3        xfs   368G  9.0G 359G   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 04/20/2016

Memory:

```
32x 00AD00B300AD HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600
MHz
64x 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/ic16.0_Sept12_2015/libs/32:/root/ic16.0_Sept12_2015/libs/64:/root/ic16.0_Sept12_2015/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
```

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## Base Compiler Invocation (Continued)

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

## 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

Continued on next page



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## Peak Compiler Invocation (Continued)

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: 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-

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## Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

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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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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