



# SPEC® CFP2006 Result

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Dell Inc.

SPECfp®2006 = 141

PowerEdge M640 (Intel Xeon Gold 6136, 3.00 GHz)

SPECfp\_base2006 = 136

CPU2006 license: 55

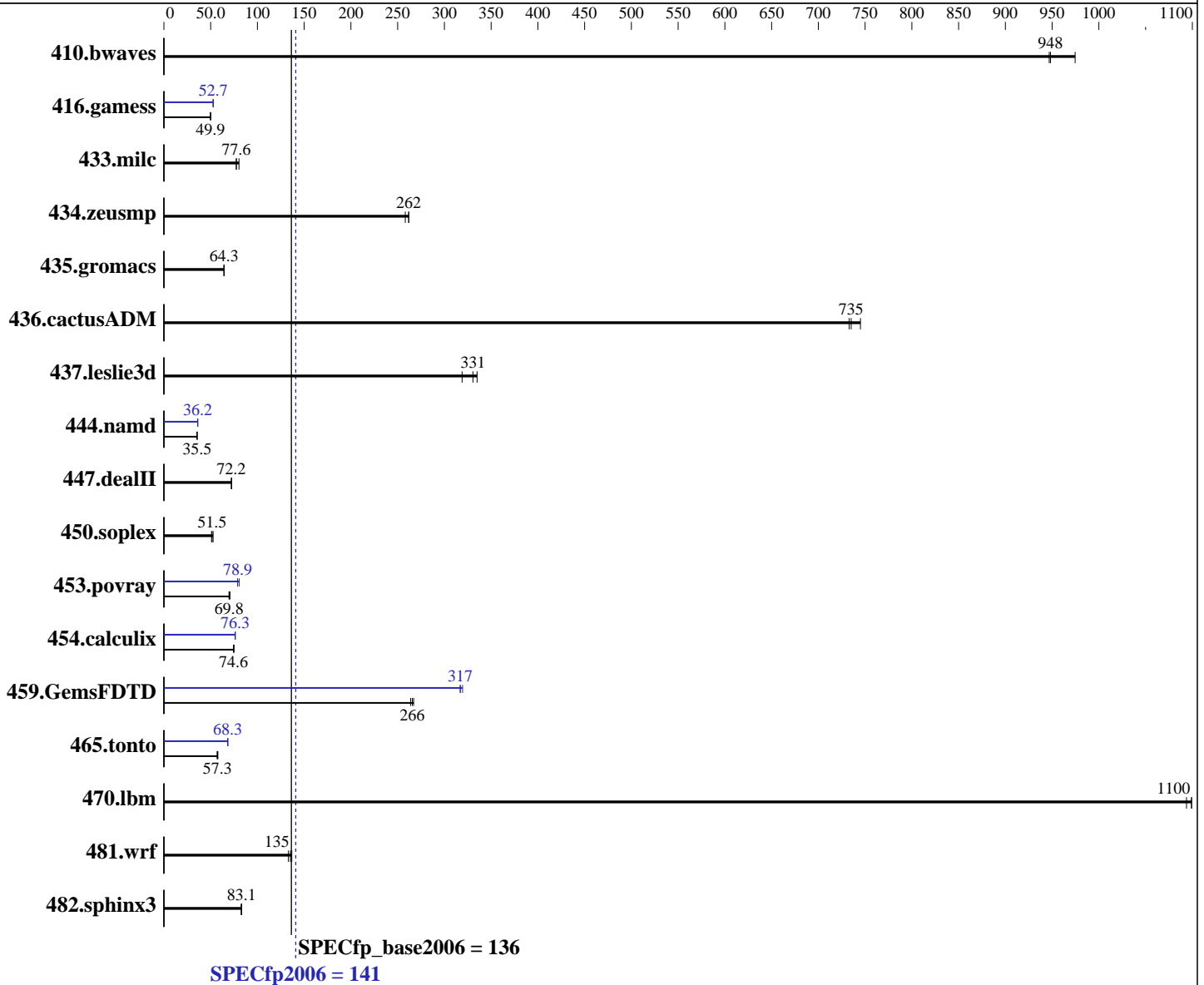
Test date: Sep-2017

Test sponsor: Dell Inc.

Hardware Availability: Sep-2017

Tested by: Dell Inc.

Software Availability: Nov-2016



## Hardware

CPU Name: Intel Xeon Gold 6136  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 3000  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 2 chips, 12 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: 1 MB I+D on chip per core

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## Software

Operating System: SUSE Linux Enterprise Server 12 SP3 (x86\_64) 4.4.70-2-default  
 Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux  
 Auto Parallel: Yes  
 File System: btrfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 24.75 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)  
 Disk Subsystem: 1 x 960 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	14.4	947	13.9	975	<b><u>14.3</u></b>	<b><u>948</u></b>	14.4	947	13.9	975	<b><u>14.3</u></b>	<b><u>948</u></b>
416.gamess	392	49.9	392	49.9	<b><u>392</u></b>	<b><u>49.9</u></b>	372	52.7	371	52.7	<b><u>372</u></b>	<b><u>52.7</u></b>
433.milc	114	80.3	119	77.4	<b><u>118</u></b>	<b><u>77.6</u></b>	114	80.3	119	77.4	<b><u>118</u></b>	<b><u>77.6</u></b>
434.zeusmp	34.7	262	35.3	258	<b><u>34.8</u></b>	<b><u>262</u></b>	34.7	262	35.3	258	<b><u>34.8</u></b>	<b><u>262</u></b>
435.gromacs	111	64.4	<b><u>111</u></b>	<b><u>64.3</u></b>	111	64.2	111	64.4	<b><u>111</u></b>	<b><u>64.3</u></b>	111	64.2
436.cactusADM	<b><u>16.3</u></b>	<b><u>735</u></b>	16.3	733	16.0	745	<b><u>16.3</u></b>	<b><u>735</u></b>	16.3	733	16.0	745
437.leslie3d	29.5	319	28.1	335	<b><u>28.4</u></b>	<b><u>331</u></b>	29.5	319	28.1	335	<b><u>28.4</u></b>	<b><u>331</u></b>
444.namd	226	35.5	<b><u>226</u></b>	<b><u>35.5</u></b>	226	35.5	222	36.2	222	36.1	<b><u>222</u></b>	<b><u>36.2</u></b>
447.dealII	158	72.5	<b><u>158</u></b>	<b><u>72.2</u></b>	159	72.1	158	72.5	<b><u>158</u></b>	<b><u>72.2</u></b>	159	72.1
450.soplex	159	52.6	<b><u>162</u></b>	<b><u>51.5</u></b>	164	50.9	159	52.6	<b><u>162</u></b>	<b><u>51.5</u></b>	164	50.9
453.povray	<b><u>76.2</u></b>	<b><u>69.8</u></b>	75.3	70.7	76.4	69.6	67.5	78.8	66.0	80.6	<b><u>67.4</u></b>	<b><u>78.9</u></b>
454.calculix	110	75.0	<b><u>111</u></b>	<b><u>74.6</u></b>	111	74.6	108	76.1	108	76.3	<b><u>108</u></b>	<b><u>76.3</u></b>
459.GemsFDTD	40.2	264	39.7	267	<b><u>39.9</u></b>	<b><u>266</u></b>	33.2	319	33.5	317	<b><u>33.5</u></b>	<b><u>317</u></b>
465.tonto	173	56.9	<b><u>172</u></b>	<b><u>57.3</u></b>	170	57.7	144	68.3	144	68.2	<b><u>144</u></b>	<b><u>68.3</u></b>
470.lbm	12.5	1100	12.6	1090	<b><u>12.5</u></b>	<b><u>1100</u></b>	12.5	1100	12.6	1090	<b><u>12.5</u></b>	<b><u>1100</u></b>
481.wrf	83.9	133	81.7	137	<b><u>82.6</u></b>	<b><u>135</u></b>	83.9	133	81.7	137	<b><u>82.6</u></b>	<b><u>135</u></b>
482.sphinx3	236	82.6	<b><u>234</u></b>	<b><u>83.1</u></b>	234	83.1	236	82.6	<b><u>234</u></b>	<b><u>83.1</u></b>	234	83.1

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:  
 Sub NUMA Cluster disabled  
 Virtualization Technology disabled  
 System Profile set to Custom  
 CPU Performance set to Maximum Performance  
 C States set to Autonomous  
 C1E disabled  
 Energy Efficient Turbo disabled  
 Uncore Frequency set to Dynamic  
 Energy Efficiency Policy set to Performance

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## Platform Notes (Continued)

Memory Patrol Scrub disabled  
 Logical Processor enabled  
 CPU Interconnect Bus Link Power Management disabled  
 PCI ASPM L1 Link Power Management disabled  
 Sysinfo program /root/cpu2006-1.2\_ic17u3/config/sysinfo.rev6993  
 Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
 running on linux-287k Sat Sep 16 02:24:57 2017

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) Gold 6136 CPU @ 3.00GHz
 2 "physical id"s (chips)
 48 "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 : 12
  siblings  : 24
  physical 0: cores 0 1 2 3 4 9 10 16 18 19 25 26
  physical 1: cores 0 1 2 3 8 9 10 11 18 19 24 27
cache size : 25344 KB
```

```
From /proc/meminfo
MemTotal: 196682072 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3
# 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-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"
```

```
uname -a:
Linux linux-287k 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017
(4502c76) x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Sep 15 22:03

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## Platform Notes (Continued)

```

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sda3       btrfs    928G  9.0G  917G   1% /
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. 1.0.0 08/10/2017

Memory:

```

12x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz
4x 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\_ic17u3/lib/ia32:/root/cpu2006-1.2\_ic17u3/lib/intel64:/root/cpu2006-1.2\_ic17u3/sh10.2"

OMP\_NUM\_THREADS = "24"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM  
memory using Redhat Enterprise Linux 7.2

Transparent Huge Pages enabled by default.

Filesystem page cache cleared with:

shell invocation of 'sync; echo 3 > /proc/sys/vm/drop\_caches' prior to run

## 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 -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

```

## 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

```



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

447.dealII: basepeak = yes

450.soplex: basepeak = yes

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

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

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

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3  
-auto -unroll4

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## Peak Optimization Flags (Continued)

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

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-ic17.0-official-linux64-revF.html>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml>

<http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml>

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

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