



SPEC[®] CFP2006 Result

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Lenovo Global Technology

ThinkSystem SR630
(2.10 GHz, Intel Xeon Platinum 8176)

SPECfp[®]2006 = **150**

SPECfp_base2006 = **143**

CPU2006 license: 9017

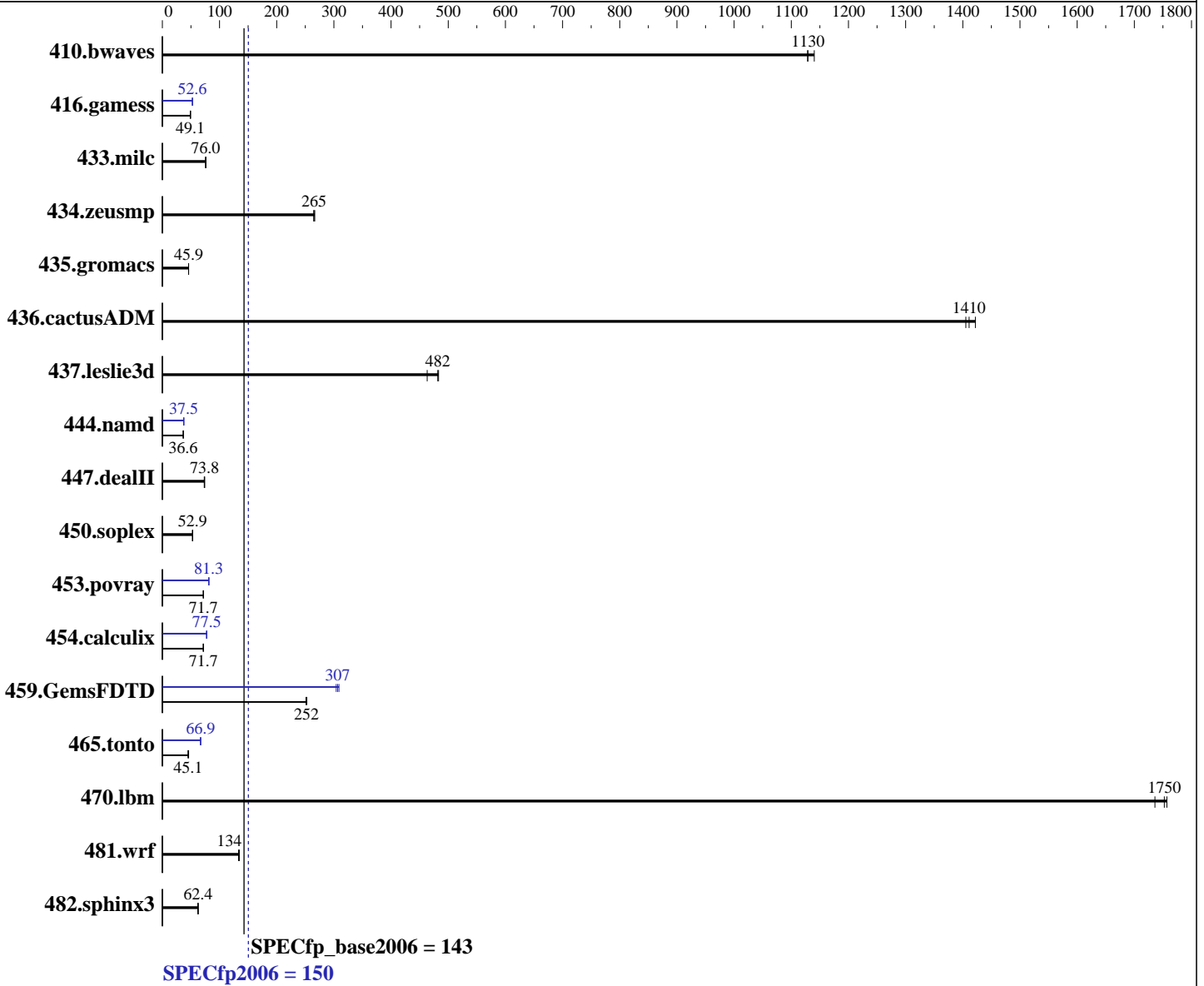
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Jul-2017

Hardware Availability: Aug-2017

Software Availability: Apr-2017



Hardware	
CPU Name:	Intel Xeon Platinum 8176
CPU Characteristics:	Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	56 cores, 2 chips, 28 cores/chip
CPU(s) orderable:	1,2 chips
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 SP2 (x86_64) Kernel 4.4.21-69-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: 38.5 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 800 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	11.9	1140	<u>12.0</u>	<u>1130</u>	12.0	1130	11.9	1140	<u>12.0</u>	<u>1130</u>	12.0	1130
416.gamess	<u>398</u>	<u>49.1</u>	398	49.2	399	49.1	<u>372</u>	<u>52.6</u>	372	52.6	372	52.6
433.milc	<u>121</u>	<u>76.0</u>	121	76.1	122	75.5	<u>121</u>	<u>76.0</u>	121	76.1	122	75.5
434.zeusmp	34.1	267	<u>34.3</u>	<u>265</u>	34.4	265	34.1	267	<u>34.3</u>	<u>265</u>	34.4	265
435.gromacs	155	46.0	156	45.8	<u>156</u>	<u>45.9</u>	155	46.0	156	45.8	<u>156</u>	<u>45.9</u>
436.cactusADM	<u>8.47</u>	<u>1410</u>	8.50	1410	8.40	1420	<u>8.47</u>	<u>1410</u>	8.50	1410	8.40	1420
437.leslie3d	20.3	463	19.5	483	<u>19.5</u>	<u>482</u>	20.3	463	19.5	483	<u>19.5</u>	<u>482</u>
444.namd	219	36.6	219	36.6	<u>219</u>	<u>36.6</u>	214	37.5	<u>214</u>	<u>37.5</u>	214	37.5
447.dealII	<u>155</u>	<u>73.8</u>	155	73.9	156	73.3	<u>155</u>	<u>73.8</u>	155	73.9	156	73.3
450.soplex	<u>158</u>	<u>52.9</u>	159	52.5	157	53.1	<u>158</u>	<u>52.9</u>	159	52.5	157	53.1
453.povray	<u>74.2</u>	<u>71.7</u>	74.1	71.8	74.3	71.6	65.4	81.4	65.5	81.2	<u>65.4</u>	<u>81.3</u>
454.calculix	115	71.9	<u>115</u>	<u>71.7</u>	115	71.5	<u>106</u>	<u>77.5</u>	107	77.4	106	77.5
459.GemsFDTD	<u>42.1</u>	<u>252</u>	42.0	253	42.2	251	34.3	309	<u>34.6</u>	<u>307</u>	34.9	304
465.tonto	<u>218</u>	<u>45.1</u>	214	46.0	219	45.0	<u>147</u>	<u>66.9</u>	147	67.1	148	66.6
470.lbm	7.82	1760	<u>7.84</u>	<u>1750</u>	7.91	1740	7.82	1760	<u>7.84</u>	<u>1750</u>	7.91	1740
481.wrf	83.1	134	<u>83.2</u>	<u>134</u>	83.8	133	83.1	134	<u>83.2</u>	<u>134</u>	83.8	133
482.sphinx3	<u>312</u>	<u>62.4</u>	310	62.9	315	61.9	<u>312</u>	<u>62.4</u>	310	62.9	315	61.9

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 configuration:
Choose Operating Mode set to Maximum Performance
Hyper-Threading set to Disable
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on Cable-SPECcpu2017-SUSE12SP2 Wed Jul 19 23:25:43 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

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Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

```

model name : Intel(R) Xeon(R) Platinum 8176 CPU @ 2.10GHz
 2 "physical id"s (chips)
 56 "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 : 28
  siblings  : 28
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
 25 26 27 28 29 30
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
 25 26 27 28 29 30
  cache size : 39424 KB

```

From /proc/meminfo

```

MemTotal:      395892392 kB
HugePages_Total:    0
Hugepagesize:    2048 kB

```

From /etc/*release* /etc/*version*

```

SuSE-release:
 SUSE Linux Enterprise Server 12 (x86_64)
 VERSION = 12
 PATCHLEVEL = 2
 # 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-SP2"
 VERSION_ID="12.2"
 PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
 ID="sles"
 ANSI_COLOR="0;32"
 CPE_NAME="cpe:/o:suse:sles:12:sp2"

```

uname -a:

```

Linux Cable-SPECcpu2017-SUSE12SP2 4.4.21-69-default #1 SMP Tue Oct 25
10:58:20 UTC 2016 (9464f67) x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Jul 19 23:25

SPEC is set to: /home/cpu2006-1.2-ic17.0u3

```

Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sda2       btrfs    744G   35G  708G   5% /home

```

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

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Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Lenovo -[IVE109Q-1.00]- 06/28/2017

Memory:

24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)

General Notes

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

KMP_AFFINITY = "granularity=fine,compact"

LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic17.0u3/lib/ia32:/home/cpu2006-1.2-ic17.0u3/lib/intel64:/home/cpu2006-1.2-ic17.0u3/sh10.2"

OMP_NUM_THREADS = "56"

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

Transparent Huge Pages disabled with:

echo never > /sys/kernel/mm/transparent_hugepage/enabled

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

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

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Base Portability Flags (Continued)

```

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

```

Peak Portability Flags

Same as Base Portability Flags



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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

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

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Peak Optimization Flags (Continued)

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/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.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/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.xml>

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