



SPEC® CFP2006 Result

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Lenovo Group Limited

Lenovo ThinkServer SD350
(2.20 GHz, Intel Xeon E5-2698 v4)

SPECfp®2006 = 126

SPECfp_base2006 = 119

CPU2006 license: 9017

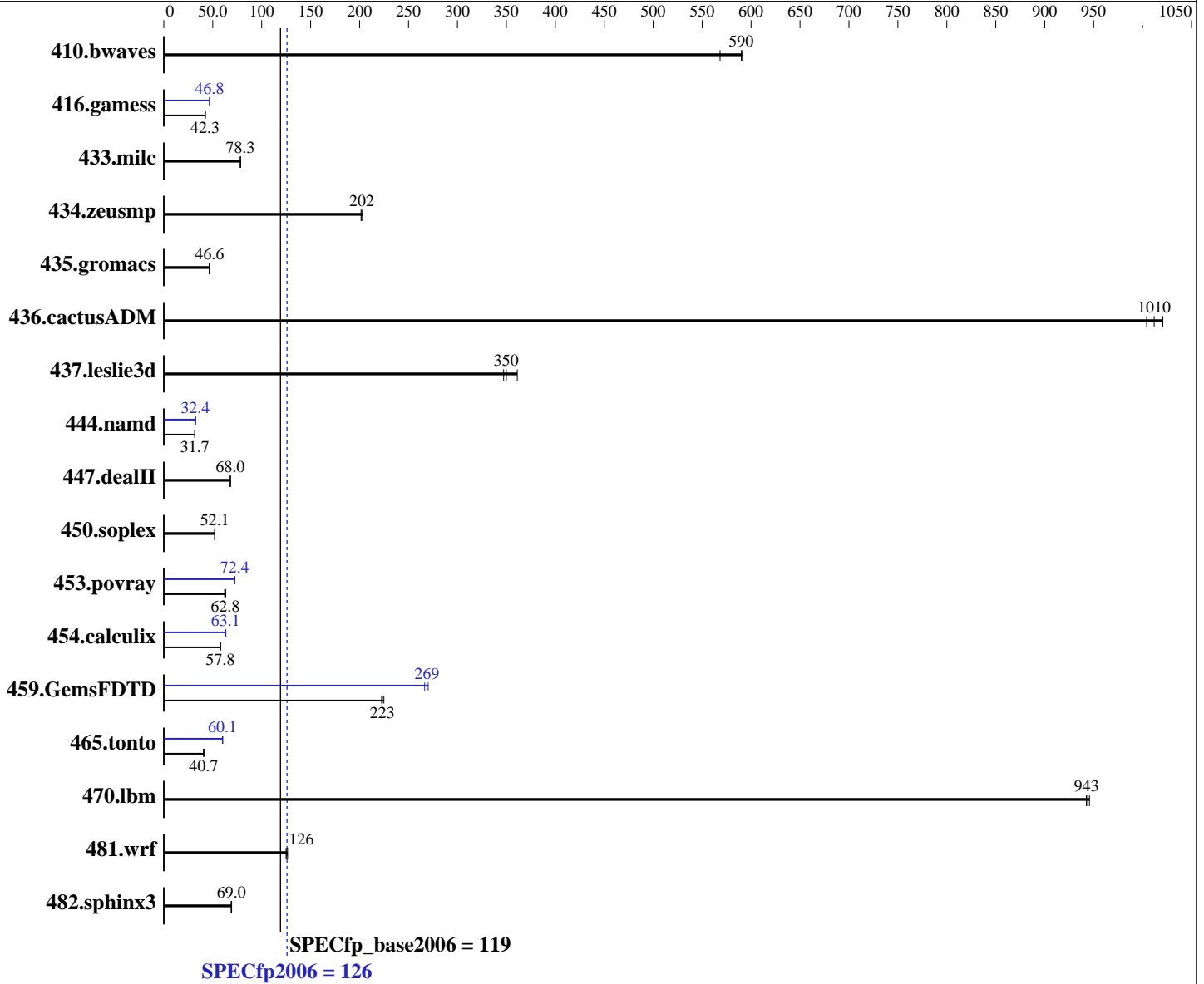
Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: Jan-2017

Hardware Availability: Sep-2016

Software Availability: Sep-2016



Hardware

CPU Name: Intel Xeon E5-2698 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
 CPU MHz: 2200
 FPU: Integrated
 CPU(s) enabled: 40 cores, 2 chips, 20 cores/chip
 CPU(s) orderable: 1,2 chips
 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 (x86_64)
 Kernel 3.12.49-11-default
 Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux;
 Fortran: Version 17.0.0.098 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: 50 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 800 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	23.0	591	23.9	568	<u>23.0</u>	<u>590</u>	23.0	591	23.9	568	<u>23.0</u>	<u>590</u>
416.gamess	<u>463</u>	<u>42.3</u>	464	42.2	462	42.4	<u>419</u>	<u>46.8</u>	419	46.7	418	46.8
433.milc	117	78.1	117	78.4	<u>117</u>	<u>78.3</u>	117	78.1	117	78.4	<u>117</u>	<u>78.3</u>
434.zeusmp	45.2	202	44.8	203	<u>45.0</u>	<u>202</u>	45.2	202	44.8	203	<u>45.0</u>	<u>202</u>
435.gromacs	<u>153</u>	<u>46.6</u>	153	46.8	154	46.4	<u>153</u>	<u>46.6</u>	153	46.8	154	46.4
436.cactusADM	11.9	1000	<u>11.8</u>	<u>1010</u>	11.7	1020	11.9	1000	<u>11.8</u>	<u>1010</u>	11.7	1020
437.leslie3d	26.0	361	27.1	347	<u>26.9</u>	<u>350</u>	26.0	361	27.1	347	<u>26.9</u>	<u>350</u>
444.namd	<u>253</u>	<u>31.7</u>	253	31.6	253	31.7	248	32.3	248	32.4	<u>248</u>	<u>32.4</u>
447.dealII	168	68.0	<u>168</u>	<u>68.0</u>	169	67.9	168	68.0	<u>168</u>	<u>68.0</u>	169	67.9
450.soplex	<u>160</u>	<u>52.1</u>	160	52.1	160	52.0	<u>160</u>	<u>52.1</u>	160	52.1	160	52.0
453.povray	85.6	62.1	<u>84.8</u>	<u>62.8</u>	84.1	63.2	73.3	72.6	74.0	71.9	<u>73.5</u>	<u>72.4</u>
454.calculix	142	58.1	143	57.7	<u>143</u>	<u>57.8</u>	<u>131</u>	<u>63.1</u>	130	63.5	131	63.1
459.GemsFDTD	<u>47.5</u>	<u>223</u>	47.7	223	47.2	225	39.8	267	39.3	270	<u>39.5</u>	<u>269</u>
465.tonto	<u>242</u>	<u>40.7</u>	241	40.9	242	40.7	164	59.9	164	60.2	<u>164</u>	<u>60.1</u>
470.lbm	14.6	943	<u>14.6</u>	<u>943</u>	14.5	946	14.6	943	<u>14.6</u>	<u>943</u>	14.5	946
481.wrf	<u>88.9</u>	<u>126</u>	89.4	125	88.3	126	<u>88.9</u>	<u>126</u>	89.4	125	88.3	126
482.sphinx3	281	69.3	283	68.8	<u>282</u>	<u>69.0</u>	281	69.3	283	68.8	<u>282</u>	<u>69.0</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"
Transparent Huge Pages disabled with:
echo never > /sys/kernel/mm/transparent_hugepage/enabled

Platform Notes

BIOS configuration:
Hyper-Threading set to Disabled
Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on SD350-Kent Sat Jan 9 17:35:24 2016

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) CPU E5-2698 v4 @ 2.20GHz
 2 "physical id"s (chips)
 40 "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 : 20
  siblings  : 20
  physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
cache size : 51200 KB

```

```

From /proc/meminfo
MemTotal:      132186556 kB
HugePages_Total:    0
Hugepagesize:    2048 kB

```

```

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 SD350-Kent 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 Jan 9 12:53

```

SPEC is set to: /home/cpu2006-1.2-ic17.0
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/md126p2    btrfs    744G  47G  696G   7% /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 determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

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Platform Notes (Continued)

BIOS American Megatrends Inc. 3.57 08/12/2016

Memory:

8x NO DIMM NO DIMM

8x Samsung M393A2G40DB1-CRC 16 GB 2 rank 2400 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-ic17.0/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2"

OMP_NUM_THREADS = "40"

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

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

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Base Portability Flags (Continued)

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

Peak Optimization Flags

C benchmarks:

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Peak Optimization Flags (Continued)

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.dealIII: 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

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

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Peak Optimization Flags (Continued)

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.html>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.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.xml>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.xml>

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Jan 25 10:54:13 2017 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 25 January 2017.