



SPEC® CFP2006 Result

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Lenovo Group Limited

SPECfp®2006 = 118

Lenovo Flex System x240 M5
(2.00 GHz, Intel Xeon E5-2660 v4)

SPECfp_base2006 = 111

CPU2006 license: 9017

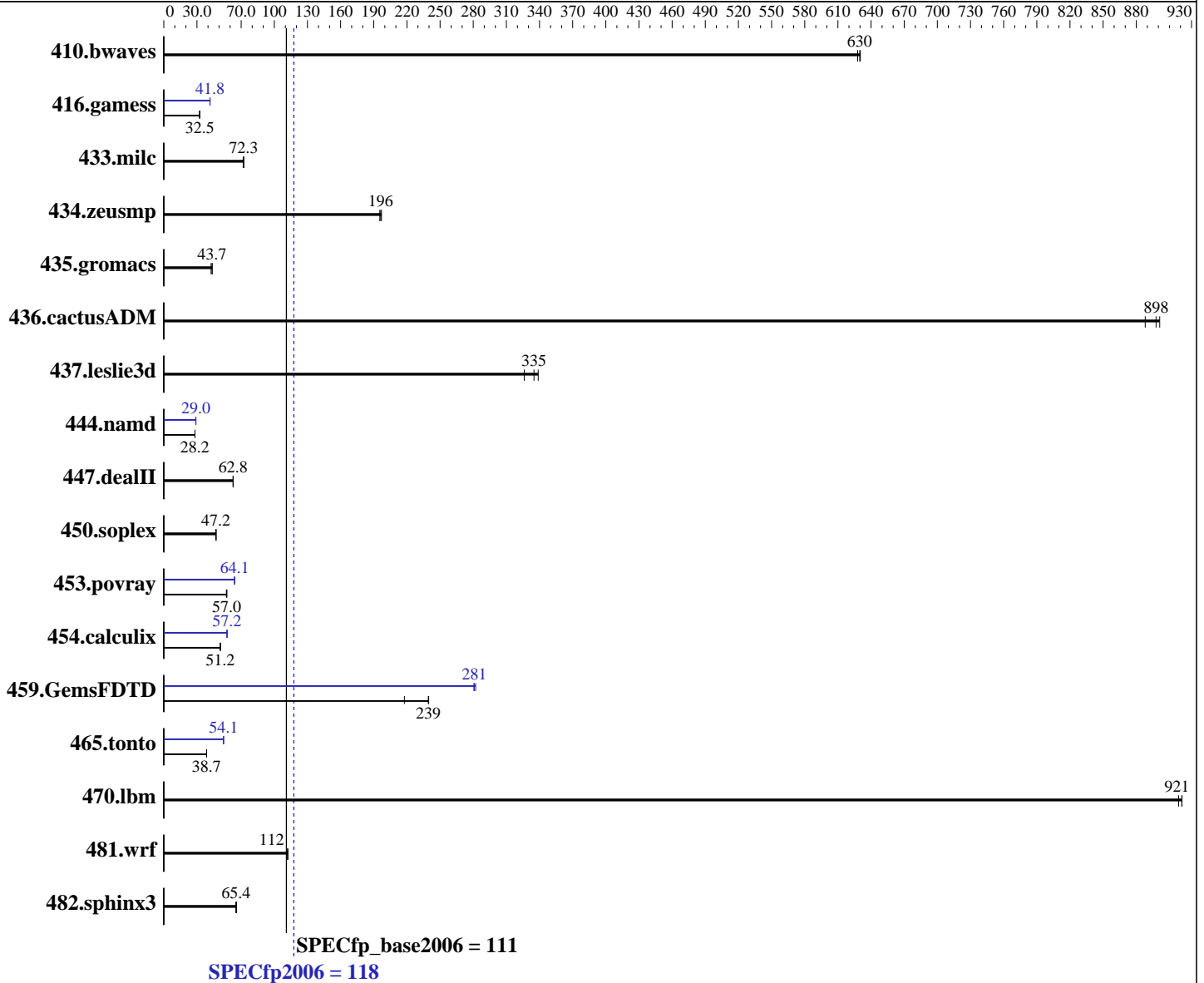
Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: Apr-2016

Hardware Availability: Mar-2016

Software Availability: Dec-2015



Hardware

CPU Name: Intel Xeon E5-2660 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
 CPU MHz: 2000
 FPU: Integrated
 CPU(s) enabled: 28 cores, 2 chips, 14 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 16.0.0.101 of Intel C++ Studio XE for Linux
 Auto Parallel: Yes
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None

Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	21.6	630	21.6	628	<u>21.6</u>	<u>630</u>	21.6	630	21.6	628	<u>21.6</u>	<u>630</u>
416.gamess	603	32.5	<u>603</u>	<u>32.5</u>	603	32.5	468	41.9	469	41.8	<u>468</u>	<u>41.8</u>
433.milc	128	71.8	127	72.4	<u>127</u>	<u>72.3</u>	128	71.8	127	72.4	<u>127</u>	<u>72.3</u>
434.zeusmp	46.6	195	<u>46.4</u>	<u>196</u>	46.2	197	46.6	195	<u>46.4</u>	<u>196</u>	46.2	197
435.gromacs	<u>163</u>	<u>43.7</u>	167	42.8	163	43.8	<u>163</u>	<u>43.7</u>	167	42.8	163	43.8
436.cactusADM	13.3	901	13.5	888	<u>13.3</u>	<u>898</u>	13.3	901	13.5	888	<u>13.3</u>	<u>898</u>
437.leslie3d	<u>28.1</u>	<u>335</u>	28.8	326	27.7	339	<u>28.1</u>	<u>335</u>	28.8	326	27.7	339
444.namd	284	28.2	<u>284</u>	<u>28.2</u>	284	28.2	277	29.0	<u>276</u>	<u>29.0</u>	276	29.0
447.dealII	183	62.6	<u>182</u>	<u>62.8</u>	182	62.8	183	62.6	<u>182</u>	<u>62.8</u>	182	62.8
450.soplex	177	47.1	<u>177</u>	<u>47.2</u>	176	47.4	177	47.1	<u>177</u>	<u>47.2</u>	176	47.4
453.povray	93.9	56.7	93.3	57.0	<u>93.4</u>	<u>57.0</u>	83.1	64.0	<u>83.0</u>	<u>64.1</u>	82.9	64.2
454.calculix	<u>161</u>	<u>51.2</u>	161	51.1	161	51.2	144	57.1	<u>144</u>	<u>57.2</u>	144	57.4
459.GemsFDTD	44.3	240	48.7	218	<u>44.3</u>	<u>239</u>	37.8	281	<u>37.7</u>	<u>281</u>	37.6	282
465.tonto	254	38.7	254	38.8	<u>254</u>	<u>38.7</u>	182	54.1	182	54.0	<u>182</u>	<u>54.1</u>
470.lbm	14.9	921	<u>14.9</u>	<u>921</u>	15.0	918	14.9	921	<u>14.9</u>	<u>921</u>	15.0	918
481.wrf	99.6	112	<u>99.6</u>	<u>112</u>	99.7	112	99.6	112	<u>99.6</u>	<u>112</u>	99.7	112
482.sphinx3	299	65.3	296	65.8	<u>298</u>	<u>65.4</u>	299	65.3	296	65.8	<u>298</u>	<u>65.4</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 Configuration:
Operating Mode set to Maximum Performance
Intel Hyperthreading set to Disabled
COD Preference set to Disable
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1
running on x240m5-cpu2006 Wed Apr 20 08:23:07 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 E5-2660 v4@ 2.00GHz
 2 "physical id"s (chips)
 28 "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 : 14
  siblings  : 14
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 35840 KB

```

From /proc/meminfo

```

MemTotal:      263828808 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 x240m5-cpu2006 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 Apr 20 03:11

SPEC is set to: /home/cpu2006-1.2-ic16.0

```

Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda4        xfs      515G      7.1G  508G   2% /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 LENOVO -[C4E123H-2.10]- 03/25/2016

Memory:

16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz

8x NO DIMM Unknown

(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-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

OMP_NUM_THREADS = "28"

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

Transparent Huge Pages disabled with:

echo never > /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

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

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Base Portability Flags (Continued)

```

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

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags



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Software Availability: Dec-2015

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

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:

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Peak Optimization Flags (Continued)

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/Lenovo-Platform-Flags-V1.2-BDW-B.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/Lenovo-Platform-Flags-V1.2-BDW-B.xml>

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For other inquiries, please contact webmaster@spec.org.

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