



# SPEC<sup>®</sup> CFP2006 Result

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## Lenovo Group Limited

SPECfp<sup>®</sup>2006 = **65.6**

Lenovo System x3100 M5  
(Intel Xeon E3-1240L v3, 3.00 GHz)

SPECfp\_base2006 = **64.3**

CPU2006 license: 9017

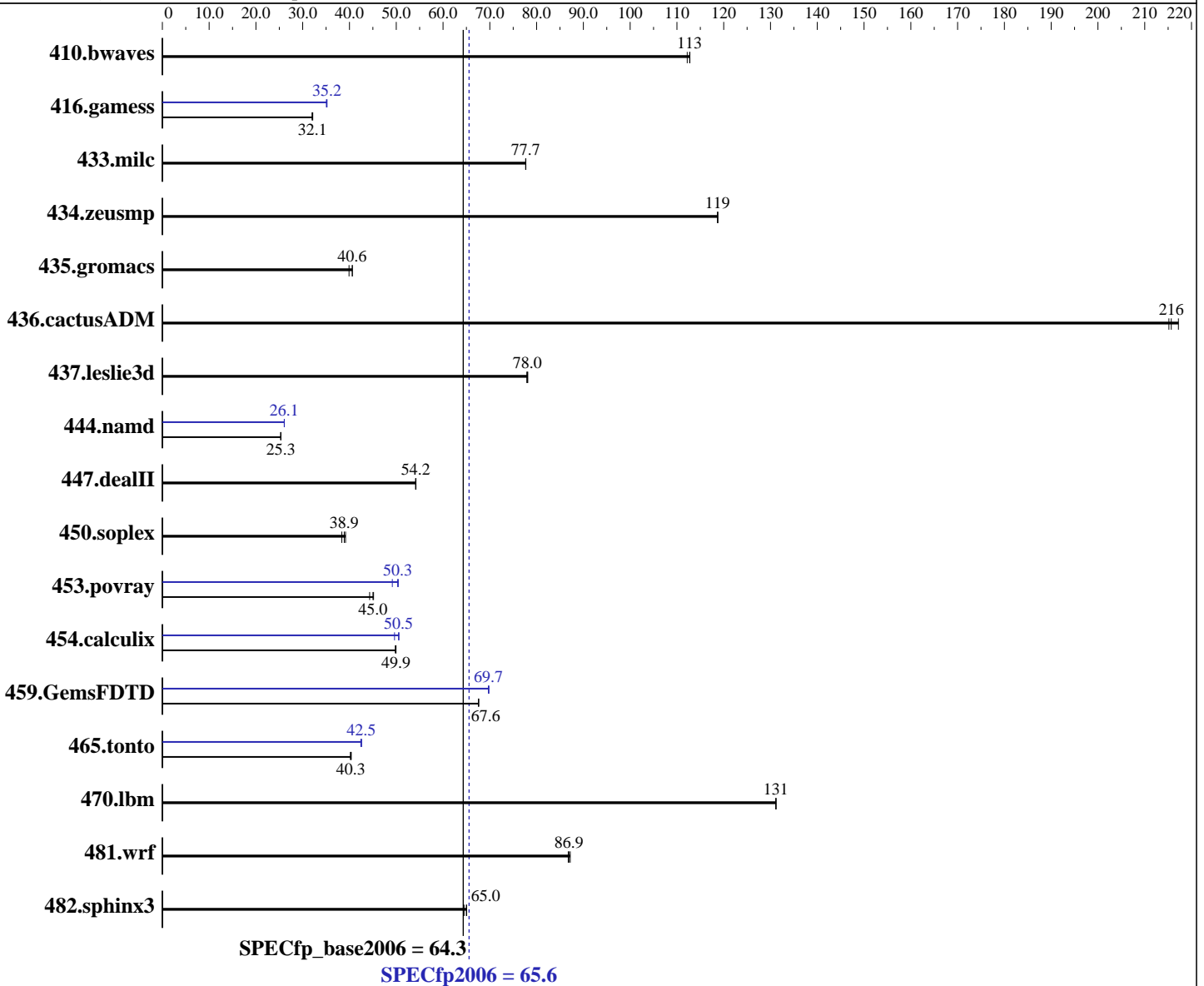
Test date: Sep-2015

Test sponsor: Lenovo Group Limited

Hardware Availability: May-2014

Tested by: Lenovo Group Limited

Software Availability: Jun-2014



### Hardware

CPU Name: Intel Xeon E3-1240L v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

Continued on next page

### Software

Operating System: Red Hat Enterprise Linux Server release 7.1 (Maipo)  
 3.10.0-229.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: xfs

Continued on next page



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L3 Cache: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 16 GB (4 x 4 GB 2Rx8 PC3L-12800E-11, ECC)  
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
Other Hardware: None

System State: Run level 3 (multi-user)  
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	121	113	<b><u>121</u></b>	<b><u>113</u></b>	121	112	121	113	<b><u>121</u></b>	<b><u>113</u></b>	121	112
416.gamess	609	32.2	612	32.0	<b><u>610</u></b>	<b><u>32.1</u></b>	<b><u>557</u></b>	<b><u>35.2</u></b>	556	35.2	559	35.1
433.milc	118	77.7	<b><u>118</u></b>	<b><u>77.7</u></b>	118	77.7	118	77.7	<b><u>118</u></b>	<b><u>77.7</u></b>	118	77.7
434.zeusmp	76.6	119	76.7	119	<b><u>76.7</u></b>	<b><u>119</u></b>	76.6	119	76.7	119	<b><u>76.7</u></b>	<b><u>119</u></b>
435.gromacs	<b><u>176</u></b>	<b><u>40.6</u></b>	176	40.6	179	39.9	<b><u>176</u></b>	<b><u>40.6</u></b>	176	40.6	179	39.9
436.cactusADM	<b><u>55.4</u></b>	<b><u>216</u></b>	55.0	217	55.5	215	<b><u>55.4</u></b>	<b><u>216</u></b>	55.0	217	55.5	215
437.leslie3d	121	77.9	120	78.1	<b><u>120</u></b>	<b><u>78.0</u></b>	121	77.9	120	78.1	<b><u>120</u></b>	<b><u>78.0</u></b>
444.namd	317	25.3	317	25.3	<b><u>317</u></b>	<b><u>25.3</u></b>	<b><u>308</u></b>	<b><u>26.1</u></b>	308	26.1	308	26.1
447.dealII	211	54.1	211	54.2	<b><u>211</u></b>	<b><u>54.2</u></b>	211	54.1	211	54.2	<b><u>211</u></b>	<b><u>54.2</u></b>
450.soplex	217	38.4	213	39.2	<b><u>215</u></b>	<b><u>38.9</u></b>	217	38.4	213	39.2	<b><u>215</u></b>	<b><u>38.9</u></b>
453.povray	118	45.1	<b><u>118</u></b>	<b><u>45.0</u></b>	120	44.3	105	50.4	<b><u>106</u></b>	<b><u>50.3</u></b>	108	49.2
454.calculix	166	49.8	165	49.9	<b><u>165</u></b>	<b><u>49.9</u></b>	<b><u>163</u></b>	<b><u>50.5</u></b>	163	50.6	166	49.6
459.GemsFDTD	157	67.6	157	67.6	<b><u>157</u></b>	<b><u>67.6</u></b>	<b><u>152</u></b>	<b><u>69.7</u></b>	152	69.7	152	69.8
465.tonto	<b><u>244</u></b>	<b><u>40.3</u></b>	244	40.4	245	40.2	<b><u>231</u></b>	<b><u>42.5</u></b>	232	42.4	231	42.6
470.lbm	105	131	<b><u>105</u></b>	<b><u>131</u></b>	105	131	105	131	<b><u>105</u></b>	<b><u>131</u></b>	105	131
481.wrf	128	87.2	129	86.8	<b><u>129</u></b>	<b><u>86.9</u></b>	128	87.2	129	86.8	<b><u>129</u></b>	<b><u>86.9</u></b>
482.sphinx3	302	64.5	<b><u>300</u></b>	<b><u>65.0</u></b>	300	65.0	302	64.5	<b><u>300</u></b>	<b><u>65.0</u></b>	300	65.0

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 setting:  
Hyper-Threading set to Disable  
Operating Mode set to "Efficiency-Favor Performance"  
Sysinfo program /root/cpu2006\_ic16/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on x3100m5.labs.lenovo.com Wed Sep 23 02:53:03 2015

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>

Continued on next page



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CPU2006 license: 9017

Test date: Sep-2015

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Hardware Availability: May-2014

Tested by: Lenovo Group Limited

Software Availability: Jun-2014

### Platform Notes (Continued)

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E3-1240L v3 @ 2.00GHz
 1 "physical id"s (chips)
 4 "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  : 4
  physical 0: cores 0 1 2 3
 cache size : 8192 KB

```

```

From /proc/meminfo
MemTotal:      16100784 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.1 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.1"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server

```

```

uname -a:
Linux x3100m5.labs.lenovo.com 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29
18:37:38 EST 2015 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Sep 22 13:07

```

SPEC is set to: /root/cpu2006_ic16
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs      50G   49G  1.6G  97% /

```

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 IBM -[J9E113LUS-1.05]- 07/06/2014

Memory:

4x Hynix/Hyundai HMT351U7EFR8A-PB 4 GB 2 rank 1600 MHz

Continued on next page



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## Platform Notes (Continued)

(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\_ic16/libs/32:/root/cpu2006\_ic16/libs/64:/root/cpu2006\_ic16/sh"

OMP\_NUM\_THREADS = "4"

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

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

Continued on next page



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## Base Portability Flags (Continued)

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

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

Continued on next page



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## Peak Optimization Flags (Continued)

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:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

Continued on next page



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## Peak Optimization Flags (Continued)

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-HSW-D.20150923.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-HSW-D.20150923.xml>

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