



# SPEC<sup>®</sup> CFP2006 Result

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## Lenovo Group Limited

SPECfp<sup>®</sup>2006 = **99.2**

Lenovo System x3550 M5  
(Intel Xeon E5-2620 v3, 2.40 GHz)

SPECfp\_base2006 = **93.8**

CPU2006 license: 9017

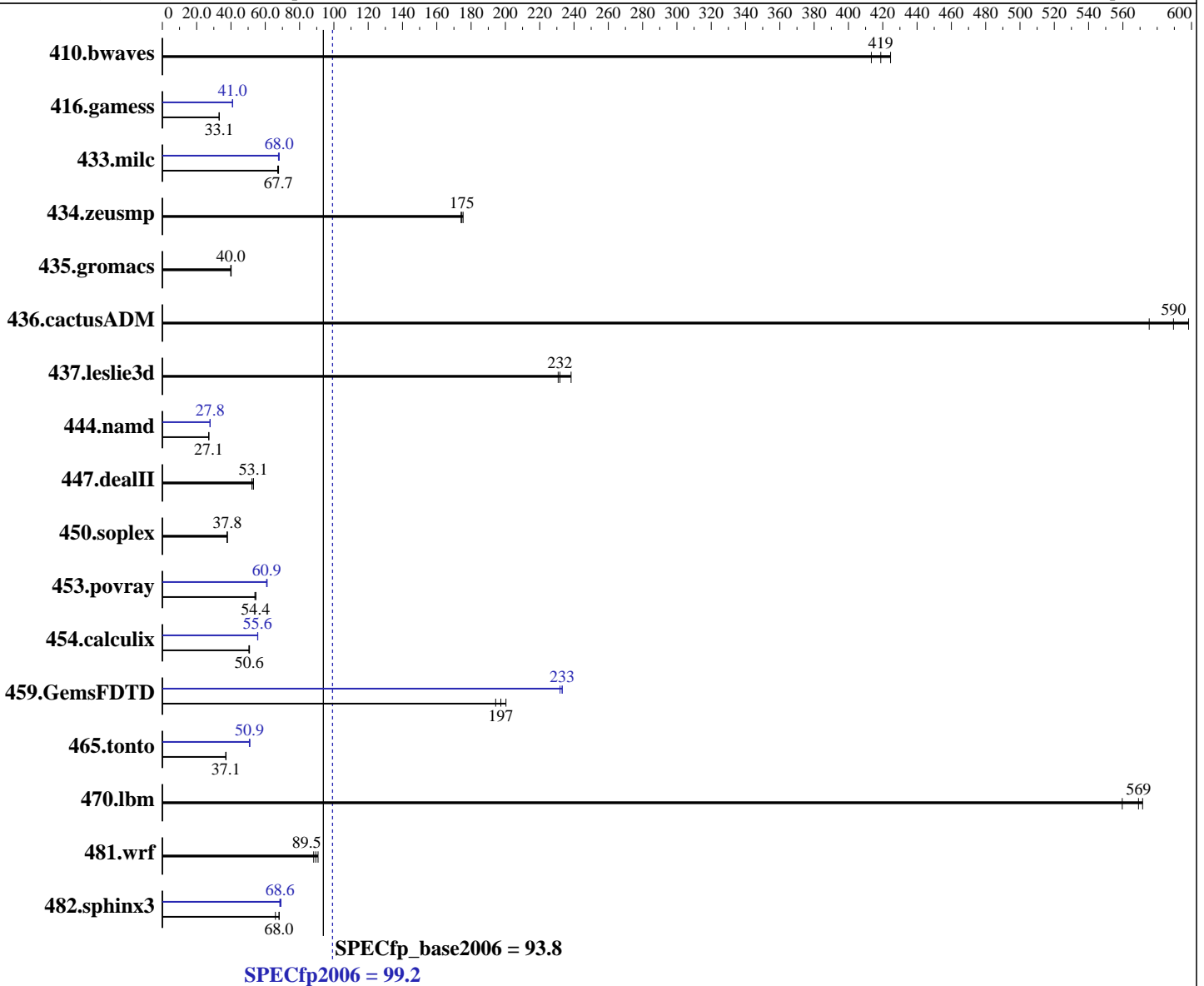
Test date: Feb-2015

Test sponsor: Lenovo Group Limited

Hardware Availability: Oct-2014

Tested by: Lenovo Group Limited

Software Availability: Sep-2014



Hardware	
CPU Name:	Intel Xeon E5-2620 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip, 2 threads/core
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:	Red Hat Enterprise Linux Server release 7.0 (Maipo)
Compiler:	3.10.0-123.el7.x86_64 C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux; Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	xfs

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L3 Cache: 15 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 Mhz)  
Disk Subsystem: 1 x 300 GB SAS  
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	32.9	413	<b>32.4</b>	<b>419</b>	32.0	425	32.9	413	<b>32.4</b>	<b>419</b>	32.0	425
416.gamess	591	33.1	591	33.1	<b>591</b>	<b>33.1</b>	<b>478</b>	<b>41.0</b>	478	41.0	480	40.8
433.milc	137	67.2	<b>136</b>	<b>67.7</b>	135	67.8	<b>135</b>	<b>68.0</b>	136	67.7	135	68.1
434.zeusmp	51.9	175	<b>52.1</b>	<b>175</b>	52.3	174	51.9	175	<b>52.1</b>	<b>175</b>	52.3	174
435.gromacs	179	39.9	178	40.1	<b>178</b>	<b>40.0</b>	179	39.9	178	40.1	<b>178</b>	<b>40.0</b>
436.cactusADM	20.8	575	<b>20.3</b>	<b>590</b>	20.0	598	20.8	575	<b>20.3</b>	<b>590</b>	20.0	598
437.leslie3d	<b>40.6</b>	<b>232</b>	39.4	238	40.7	231	<b>40.6</b>	<b>232</b>	39.4	238	40.7	231
444.namd	297	27.0	296	27.1	<b>296</b>	<b>27.1</b>	288	27.9	289	27.8	<b>288</b>	<b>27.8</b>
447.dealII	219	52.2	<b>216</b>	<b>53.1</b>	215	53.1	219	52.2	<b>216</b>	<b>53.1</b>	215	53.1
450.soplex	221	37.8	<b>221</b>	<b>37.8</b>	220	37.9	221	37.8	<b>221</b>	<b>37.8</b>	220	37.9
453.povray	97.7	54.5	<b>97.7</b>	<b>54.4</b>	98.6	53.9	87.5	60.8	<b>87.4</b>	<b>60.9</b>	87.1	61.1
454.calculix	162	50.8	<b>163</b>	<b>50.6</b>	163	50.5	148	55.7	<b>148</b>	<b>55.6</b>	149	55.5
459.GemsFDTD	54.6	194	53.0	200	<b>53.8</b>	<b>197</b>	45.8	232	45.5	233	<b>45.5</b>	<b>233</b>
465.tonto	<b>266</b>	<b>37.1</b>	266	37.0	265	37.2	193	51.0	194	50.7	<b>193</b>	<b>50.9</b>
470.lbm	<b>24.1</b>	<b>569</b>	24.0	572	24.6	560	<b>24.1</b>	<b>569</b>	24.0	572	24.6	560
481.wrf	<b>125</b>	<b>89.5</b>	127	88.2	123	90.8	<b>125</b>	<b>89.5</b>	127	88.2	123	90.8
482.sphinx3	296	65.9	<b>287</b>	<b>68.0</b>	286	68.1	<b>284</b>	<b>68.6</b>	284	68.5	282	69.2

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:  
Operating Mode set to "Efficiency-Favor Performance"  
Sysinfo program /home/SPEC/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on x3550m5 Fri Feb 13 22:10:24 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>

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### Platform Notes (Continued)

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2620 v3 @ 2.40GHz
 2 "physical id"s (chips)
24 "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 : 6
  siblings  : 12
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
cache size : 15360 KB

```

```

From /proc/meminfo
MemTotal:      263633996 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.0 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.0"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

```

```

uname -a:
Linux x3550m5 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014 x86_64
x86_64 x86_64 GNU/Linux

```

```

SPEC is set to: /home/SPEC
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs   275G  12G  263G   5% /

```

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 -[TBE103AUS-1.01]- 10/23/2014

Memory:  
14x Hynix 484D4134324752374D4652344E2D54462020 16 GB 2 rank 2133 MHz,  
configured at 1867 MHz

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## Platform Notes (Continued)

2x Hynix 484D4134324752374D4652344E2D54465431 16 GB 2 rank 2133 MHz,  
configured at 1867 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,1,0"

LD\_LIBRARY\_PATH = "/home/SPEC/libs/32:/home/SPEC/libs/64:/home/SPEC/sh"

OMP\_NUM\_THREADS = "12"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB  
memory using RedHat EL 7.0

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

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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 -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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**Tested by:** Lenovo Group Limited

**Software Availability:** Sep-2014

## Peak Optimization Flags

### C benchmarks:

433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-auto-ilp32 -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel

### C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

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

### Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -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(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

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

### Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

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## Peak Optimization Flags (Continued)

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-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-B.20141230.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-B.20141230.xml>

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