



# SPEC<sup>®</sup> CFP2006 Result

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## Lenovo Group Limited

SPECfp<sup>®</sup>2006 = 117

Lenovo System x3500 M5  
(Intel Xeon E5-2643 v3, 3.40 GHz)

SPECfp\_base2006 = 113

CPU2006 license: 9017

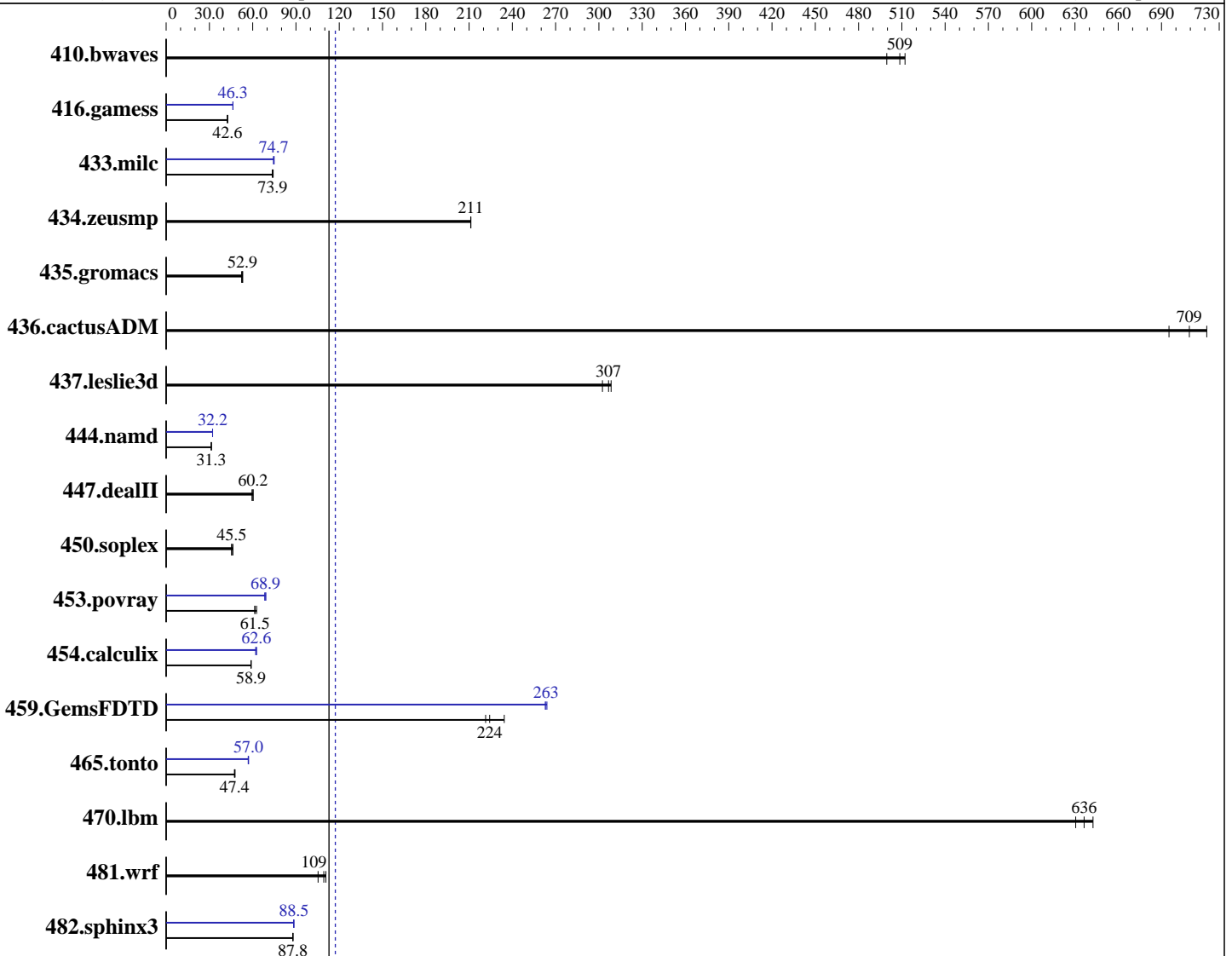
Test date: May-2015

Test sponsor: Lenovo Group Limited

Hardware Availability: Jan-2015

Tested by: Lenovo Group Limited

Software Availability: Sep-2014



SPECfp\_base2006 = 113

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### Hardware

CPU Name: Intel Xeon E5-2643 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 3400  
 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)  
 3.10.0-123.el7.x86\_64  
 Compiler: 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: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
Disk Subsystem: 1 x 960 GB SATA SSD  
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	<b><u>26.7</u></b>	<b><u>509</u></b>	26.5	512	27.2	500	<b><u>26.7</u></b>	<b><u>509</u></b>	26.5	512	27.2	500
416.gamess	<b><u>460</u></b>	<b><u>42.6</u></b>	460	42.6	462	42.4	423	46.3	423	46.3	<b><u>423</u></b>	<b><u>46.3</u></b>
433.milc	125	73.6	<b><u>124</u></b>	<b><u>73.9</u></b>	124	74.2	123	74.4	<b><u>123</u></b>	<b><u>74.7</u></b>	123	74.9
434.zeusmp	<b><u>43.1</u></b>	<b><u>211</u></b>	43.1	211	43.1	211	<b><u>43.1</u></b>	<b><u>211</u></b>	43.1	211	43.1	211
435.gromacs	135	53.1	136	52.3	<b><u>135</u></b>	<b><u>52.9</u></b>	135	53.1	136	52.3	<b><u>135</u></b>	<b><u>52.9</u></b>
436.cactusADM	16.6	721	17.2	695	<b><u>16.8</u></b>	<b><u>709</u></b>	16.6	721	17.2	695	<b><u>16.8</u></b>	<b><u>709</u></b>
437.leslie3d	30.5	308	31.1	302	<b><u>30.7</u></b>	<b><u>307</u></b>	30.5	308	31.1	302	<b><u>30.7</u></b>	<b><u>307</u></b>
444.namd	256	31.3	<b><u>256</u></b>	<b><u>31.3</u></b>	256	31.4	249	32.2	249	32.2	<b><u>249</u></b>	<b><u>32.2</u></b>
447.dealII	<b><u>190</u></b>	<b><u>60.2</u></b>	190	60.3	192	59.5	<b><u>190</u></b>	<b><u>60.2</u></b>	190	60.3	192	59.5
450.soplex	<b><u>183</u></b>	<b><u>45.5</u></b>	184	45.4	180	46.3	<b><u>183</u></b>	<b><u>45.5</u></b>	184	45.4	180	46.3
453.povray	86.5	61.5	84.8	62.7	<b><u>86.5</u></b>	<b><u>61.5</u></b>	<b><u>77.2</u></b>	<b><u>68.9</u></b>	77.9	68.3	77.0	69.1
454.calculix	<b><u>140</u></b>	<b><u>58.9</u></b>	140	58.9	140	58.8	<b><u>132</u></b>	<b><u>62.6</u></b>	132	62.6	133	62.0
459.GemsFDTD	47.9	221	<b><u>47.3</u></b>	<b><u>224</u></b>	45.3	234	40.2	264	40.4	263	<b><u>40.3</u></b>	<b><u>263</u></b>
465.tonto	206	47.8	208	47.4	<b><u>207</u></b>	<b><u>47.4</u></b>	<b><u>173</u></b>	<b><u>57.0</u></b>	173	56.9	172	57.2
470.lbm	<b><u>21.6</u></b>	<b><u>636</u></b>	21.8	631	21.4	643	<b><u>21.6</u></b>	<b><u>636</u></b>	21.8	631	21.4	643
481.wrf	101	111	106	105	<b><u>102</u></b>	<b><u>109</u></b>	101	111	106	105	<b><u>102</u></b>	<b><u>109</u></b>
482.sphinx3	222	88.0	<b><u>222</u></b>	<b><u>87.8</u></b>	222	87.8	<b><u>220</u></b>	<b><u>88.5</u></b>	220	88.4	220	88.6

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 x3500M5 Mon May 18 12:13:38 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 E5-2643 v3 @ 3.40GHz

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 : 20480 KB

From /proc/meminfo

MemTotal: 263456756 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 x3500M5 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 927G 140G 787G 16% /

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 -[TAE103F-1.02]- 12/05/2014

Memory:

8x Hynix HMA42GR7MFR4N-TFT1 16 GB 2 rank 2133 MHz

8x NO DIMM HMA42GR7MFR4N-TFT1 16 GB 2 rank 2133 MHz

8x NO DIMM Unknown

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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 = "/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.deallI: -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

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## Base Portability Flags (Continued)

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

## Peak Optimization Flags

C benchmarks:

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## Peak Optimization Flags (Continued)

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.dealIII: 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

436.cactusADM: basepeak = yes

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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-ic15.0-official-linux64.html>  
<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-B.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.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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