



# SPEC® CFP2006 Result

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## Lenovo Group Limited

SPECfp®2006 = 108

Lenovo System x3250 M6  
(3.90 GHz, Intel Xeon E3-1280 v6)

SPECfp\_base2006 = 106

CPU2006 license: 9017

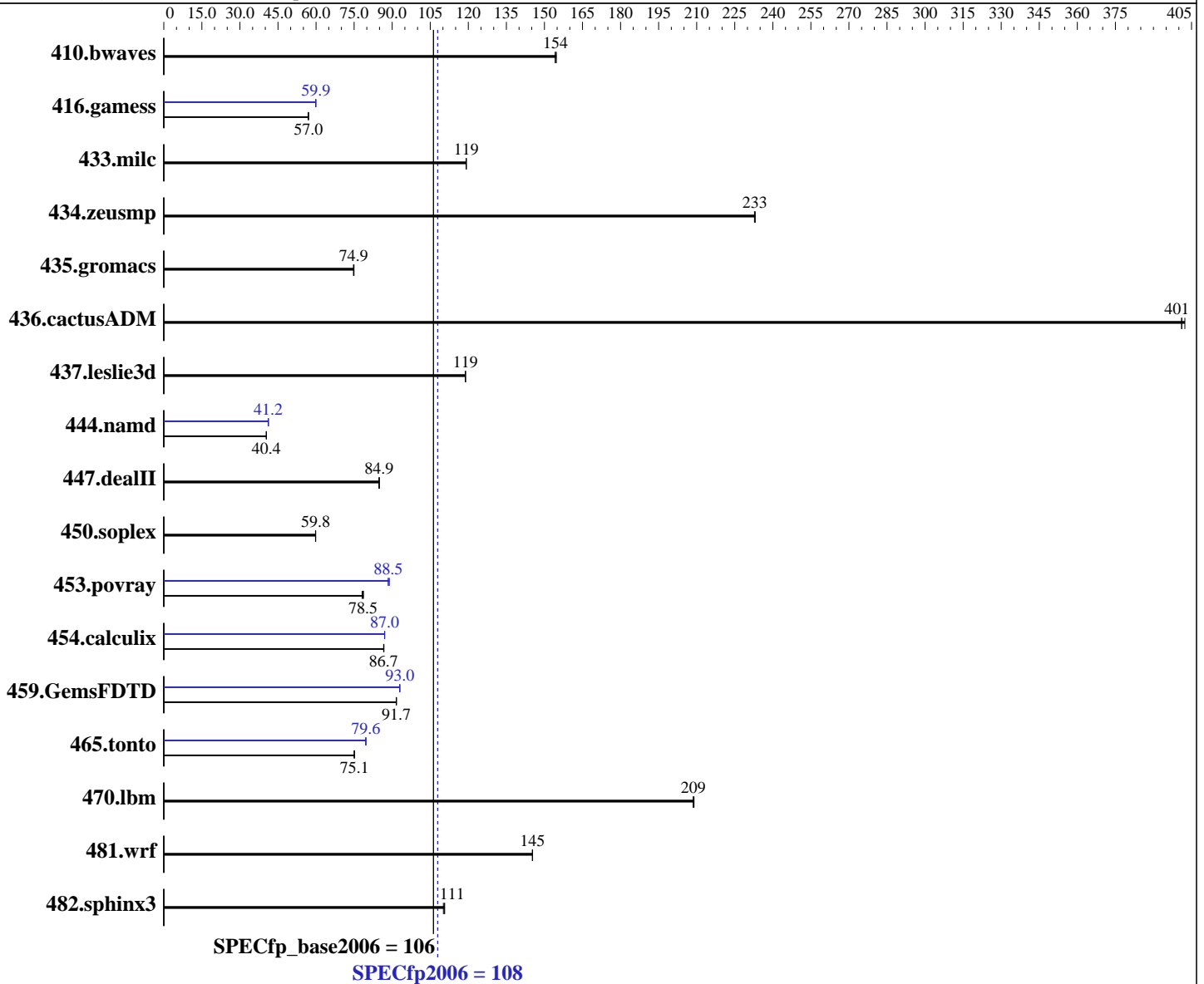
Test sponsor: Lenovo Group Limited

Tested by: Lenovo Group Limited

Test date: Mar-2017

Hardware Availability: Apr-2017

Software Availability: Nov-2016



### Hardware

CPU Name: Intel Xeon E3-1280 v6  
 CPU Characteristics: Intel Turbo Boost Technology up to 4.20 GHz  
 CPU MHz: 3900  
 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

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### Software

Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
 Kernel 3.10.0-514.el7.x86\_64  
 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: xfs

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L3 Cache: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2400T-U)  
Disk Subsystem: 1 x 800 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>88.0</b>	<b>154</b>	88.1	154	87.9	155	<b>88.0</b>	<b>154</b>	88.1	154	87.9	155
416.gamess	343	57.0	344	57.0	<b>344</b>	<b>57.0</b>	327	59.9	327	59.8	<b>327</b>	<b>59.9</b>
433.milc	77.1	119	77.0	119	<b>77.0</b>	<b>119</b>	77.1	119	77.0	119	<b>77.0</b>	<b>119</b>
434.zeusmp	39.1	233	39.0	233	<b>39.1</b>	<b>233</b>	39.1	233	39.0	233	<b>39.1</b>	<b>233</b>
435.gromacs	<b>95.4</b>	<b>74.9</b>	95.5	74.7	95.2	75.0	<b>95.4</b>	<b>74.9</b>	95.5	74.7	95.2	75.0
436.cactusADM	<b>29.8</b>	<b>401</b>	29.7	402	29.8	401	<b>29.8</b>	<b>401</b>	29.7	402	29.8	401
437.leslie3d	79.1	119	<b>79.1</b>	<b>119</b>	79.1	119	79.1	119	<b>79.1</b>	<b>119</b>	79.1	119
444.namd	199	40.4	198	40.5	<b>198</b>	<b>40.4</b>	195	41.2	<b>195</b>	<b>41.2</b>	195	41.2
447.dealII	135	85.0	135	84.8	<b>135</b>	<b>84.9</b>	135	85.0	135	84.8	<b>135</b>	<b>84.9</b>
450.soplex	139	59.9	<b>139</b>	<b>59.8</b>	140	59.8	139	59.9	<b>139</b>	<b>59.8</b>	140	59.8
453.povray	<b>67.8</b>	<b>78.5</b>	67.6	78.7	68.1	78.2	59.8	88.9	60.2	88.4	<b>60.1</b>	<b>88.5</b>
454.calculix	95.1	86.8	<b>95.2</b>	<b>86.7</b>	95.2	86.6	94.7	87.1	<b>94.8</b>	<b>87.0</b>	94.8	87.0
459.GemsFDTD	116	91.7	116	91.6	<b>116</b>	<b>91.7</b>	114	92.9	114	93.0	<b>114</b>	<b>93.0</b>
465.tonto	<b>131</b>	<b>75.1</b>	131	75.2	131	75.0	<b>124</b>	<b>79.6</b>	124	79.6	124	79.6
470.lbm	65.8	209	65.9	209	<b>65.8</b>	<b>209</b>	65.8	209	65.9	209	<b>65.8</b>	<b>209</b>
481.wrf	<b>76.9</b>	<b>145</b>	76.9	145	76.9	145	<b>76.9</b>	<b>145</b>	76.9	145	76.9	145
482.sphinx3	176	111	<b>176</b>	<b>111</b>	177	110	176	111	<b>176</b>	<b>111</b>	177	110

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 enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1> /proc/sys/vm/drop_caches
```

## Platform Notes

BIOS configuration:  
Intel Virtualization Technology set to Disable  
Operating Mode set to Maximum Performance  
Hyper-Threading set to Disable  
Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)

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### Platform Notes (Continued)

running on miaoli-01-rhel7.3 Sun Mar 19 20:55:06 2017

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>

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) CPU E3-1280 v6 @ 3.90GHz
 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:      65932404 kB
HugePages_Total:      0
Hugepagesize:    2048 kB
```

From /etc/\*release\* /etc/\*version\*

```
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server
```

uname -a:

```
Linux miaoli-01-rhel7.3 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT
2016 x86_64 x86_64 x86_64 GNU/Linux
```

run-level 3 Mar 17 14:02

SPEC is set to: /home/cpu2006-1.2-ic17.0

```
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda4        xfs      689G      4.6G  685G   1% /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 -[M3E121PUS-2.00]- 03/14/2017

Memory:

4x Samsung M378A2K43BB1-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 = "4"

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.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

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## Base Portability Flags (Continued)

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-Flags-V1.2-BDW-D.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-Flags-V1.2-BDW-D.xml>

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

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