Lenovo Group Limited
Lenovo Flex System x240 M5
(2.60 GHz, Intel Xeon E5-2623 v4)

SPECfp®2006 = 97.8
SPECfp_base2006 = 93.7

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Software Availability: Mar-2016
Test date: Jun-2016
Hardware Availability: Dec-2015

Lenovo Group Limited

Hardware

CPU Name: Intel Xeon E5-2623 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2600
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 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

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;
Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Lenovo Group Limited

Lenovo Flex System x240 M5
(2.60 GHz, Intel Xeon E5-2623 v4)

SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

Lenovo Group Limited

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

L3 Cache: 10 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)
Disk Subsystem: 2 x 600 GB 15000 RPM SAS, RAID 1
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>37.8</td>
<td>360</td>
<td>37.1</td>
<td>366</td>
<td>36.9</td>
<td>368</td>
</tr>
<tr>
<td>416.gamess</td>
<td>554</td>
<td>35.3</td>
<td>565</td>
<td>35.2</td>
<td>467</td>
<td>41.9</td>
</tr>
<tr>
<td>433.milc</td>
<td>129</td>
<td>70.9</td>
<td>129</td>
<td>71.1</td>
<td>129</td>
<td>71.0</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>56.2</td>
<td>162</td>
<td>56.5</td>
<td>161</td>
<td>56.8</td>
<td>160</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>142</td>
<td>50.3</td>
<td>142</td>
<td>50.4</td>
<td>142</td>
<td>50.1</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>24.5</td>
<td>487</td>
<td>24.4</td>
<td>489</td>
<td>24.5</td>
<td>488</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>43.7</td>
<td>315</td>
<td>43.7</td>
<td>215</td>
<td>43.9</td>
<td>214</td>
</tr>
<tr>
<td>444.namd</td>
<td>284</td>
<td>28.2</td>
<td>285</td>
<td>28.2</td>
<td>286</td>
<td>28.2</td>
</tr>
<tr>
<td>447.dealII</td>
<td>183</td>
<td>62.4</td>
<td>183</td>
<td>62.6</td>
<td>183</td>
<td>62.6</td>
</tr>
<tr>
<td>450.soplex</td>
<td>217</td>
<td>38.5</td>
<td>217</td>
<td>38.4</td>
<td>217</td>
<td>38.5</td>
</tr>
<tr>
<td>453.povray</td>
<td>93.1</td>
<td>57.1</td>
<td>93.9</td>
<td>56.7</td>
<td>94.4</td>
<td>56.4</td>
</tr>
<tr>
<td>454.calculix</td>
<td>152</td>
<td>54.2</td>
<td>152</td>
<td>54.3</td>
<td>143</td>
<td>57.8</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>67.3</td>
<td>158</td>
<td>67.9</td>
<td>156</td>
<td>66.6</td>
<td>159</td>
</tr>
<tr>
<td>465.tonto</td>
<td>227</td>
<td>43.4</td>
<td>228</td>
<td>43.2</td>
<td>227</td>
<td>43.4</td>
</tr>
<tr>
<td>470.lbm</td>
<td>28.0</td>
<td>491</td>
<td>27.9</td>
<td>492</td>
<td>28.0</td>
<td>492</td>
</tr>
<tr>
<td>481.wrf</td>
<td>136</td>
<td>82.3</td>
<td>135</td>
<td>82.5</td>
<td>134</td>
<td>83.2</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>268</td>
<td>72.8</td>
<td>268</td>
<td>72.9</td>
<td>269</td>
<td>72.6</td>
</tr>
</tbody>
</table>

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
Hyper-Threading set to Disabled
COD Preference set to Disable

Sysinfo program /home/cpu2006-1.2-1c16.0/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb867b5a285932ceab81e28219e1
running on Bonnevil-01 Fri Jun  3 01:39:54 2016

This section contains SUT (System Under Test) info as seen by

continued on next page
## Lenovo Group Limited

### Lenovo Flex System x240 M5

(2.60 GHz, Intel Xeon E5-2623 v4)

### SPEC CFP2006 Result

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test date:</td>
<td>Jun-2016</td>
</tr>
<tr>
<td>Test sponsor:</td>
<td>Lenovo Group Limited</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Group Limited</td>
</tr>
<tr>
<td>SPECfp2006 =</td>
<td>97.8</td>
</tr>
<tr>
<td>SPECfp_base2006 =</td>
<td>93.7</td>
</tr>
</tbody>
</table>

| Hardware Availability: | Mar-2016 |
| Software Availability: | Dec-2015 |

### Platform Notes (Continued)

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 E5-2623 v4@ 2.60GHz
- 2 "physical id"s (chips)
- 8 "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
  - Physical 1: cores 0 1 2 3
- Cache size: 10240 KB

From /proc/meminfo
- MemTotal: 263831900 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - Version = 12
  - Patches = 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:
  (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 2 20:14

SPEC is set to: /home/cpu2006-1.2-ic16.0
- Filesystem Type Size Used Avail Use% Mounted on
  - /dev/sda4 xfs 502G 6.4G 496G 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...
**Lenovo Group Limited**  
Lenovo Flex System x240 M5  
(2.60 GHz, Intel Xeon E5-2623 v4)  

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>97.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>93.7</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 9017  
**Test sponsor:** Lenovo Group Limited  
**Tested by:** Lenovo Group Limited  
**Test date:** Jun-2016  
**Hardware Availability:** Mar-2016  
**Software Availability:** Dec-2015

---

**Platform Notes (Continued)**

- hardware, firmware, and the "DMTF SMBIOS" standard.
- BIOS LENOVO -[C4E124J-2.10]- 05/05/2016
- Memory:  
  - 16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz, configured at 2133 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 = "8"

  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 -nofor_main
- 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
- 437.leslie3d: -DSPEC_CPU_LP64
- 444.namd: -DSPEC_CPU_LP64
- 447.dealII: -DSPEC_CPU_LP64

Continued on next page
Lenovo Group Limited
Lenovo Flex System x240 M5
(2.60 GHz, Intel Xeon E5-2623 v4)

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>97.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>93.7</td>
</tr>
</tbody>
</table>

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: Jun-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

### Base Portability Flags (Continued)

- 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
- 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
Lenovo Group Limited
Lenovo Flex System x240 M5
(2.60 GHz, Intel Xeon E5-2623 v4)

SPECfp2006 = 97.8
SPECfp_base2006 = 93.7

CPU2006 license: 9017
Test date: Jun-2016
Test sponsor: Lenovo Group Limited
Hardware Availability: Mar-2016
Tested by: Lenovo Group Limited
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:

Continued on next page
SPEC CFP2006 Result

Lenovo Group Limited
Lenovo Flex System x240 M5 (2.60 GHz, Intel Xeon E5-2623 v4)

| SPECfp2006 = | 97.8 |
| SPECfp_base2006 = | 93.7 |

CPU2006 license: 9017
Test date: Jun-2016
Test sponsor: Lenovo Group Limited
Hardware Availability: Mar-2016
Tested by: Lenovo Group Limited
Software Availability: Dec-2015

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

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 28 June 2016.