## Lenovo Global Technology

### Test details

<table>
<thead>
<tr>
<th>CPU2006 license</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Silver 4112</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.00 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2600</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>8 cores, 2 chips, 4 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td></td>
</tr>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server 12 SP2 (x86_64)</td>
</tr>
<tr>
<td></td>
<td>Kernel 4.4.21-69-default</td>
</tr>
<tr>
<td>Compiler</td>
<td>C++: Version 17.0.0.098 of Intel C++ Compiler for Linux; Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>btrfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

### Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>bwaves</td>
<td>42.0</td>
<td>42.0</td>
</tr>
<tr>
<td>gamess</td>
<td>39.4</td>
<td>39.4</td>
</tr>
<tr>
<td>milc</td>
<td>64.6</td>
<td>64.6</td>
</tr>
<tr>
<td>zeusmp</td>
<td>184</td>
<td>184</td>
</tr>
<tr>
<td>gromacs</td>
<td>50.3</td>
<td>50.3</td>
</tr>
<tr>
<td>cactusADM</td>
<td>249</td>
<td>249</td>
</tr>
<tr>
<td>leslie3d</td>
<td>29.6</td>
<td>29.6</td>
</tr>
<tr>
<td>namd</td>
<td>28.9</td>
<td>28.9</td>
</tr>
<tr>
<td>dealII</td>
<td>58.5</td>
<td>58.5</td>
</tr>
<tr>
<td>soplex</td>
<td>36.6</td>
<td>36.6</td>
</tr>
<tr>
<td>povray</td>
<td>64.2</td>
<td>64.2</td>
</tr>
<tr>
<td>calculix</td>
<td>60.8</td>
<td>60.8</td>
</tr>
<tr>
<td>GemsFDTD</td>
<td>182</td>
<td>182</td>
</tr>
<tr>
<td>tonto</td>
<td>54.6</td>
<td>54.6</td>
</tr>
<tr>
<td>lbm</td>
<td>45.2</td>
<td>45.2</td>
</tr>
<tr>
<td>wrf</td>
<td>80.8</td>
<td>80.8</td>
</tr>
<tr>
<td>sphinx3</td>
<td>66.1</td>
<td>66.1</td>
</tr>
</tbody>
</table>

**SPECfp®2006 = 102**

**SPECfp_base2006 = 98.8**
Lenovo Global Technology
ThinkSystem SR550
(2.60 GHz, Intel Xeon Silver 4112)

SPEC CFP2006 Result

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
L3 Cache: 8.25 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2400 MHz)
Disk Subsystem: 1 x 800 GB SATA SSD
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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>27.6</td>
<td>492</td>
<td>27.8</td>
<td>489</td>
<td>28.1</td>
<td>484</td>
<td>27.6</td>
<td>492</td>
<td>27.8</td>
<td>489</td>
</tr>
<tr>
<td>416.gamess</td>
<td>497</td>
<td>394</td>
<td>498</td>
<td>393</td>
<td>497</td>
<td>394</td>
<td>466</td>
<td>42.0</td>
<td>466</td>
<td>42.0</td>
</tr>
<tr>
<td>433.milc</td>
<td>144</td>
<td>63.6</td>
<td>142</td>
<td>64.7</td>
<td>142</td>
<td>64.6</td>
<td>144</td>
<td>63.6</td>
<td>142</td>
<td>64.7</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>49.7</td>
<td>183</td>
<td>49.5</td>
<td>184</td>
<td>49.3</td>
<td>185</td>
<td>49.7</td>
<td>183</td>
<td>49.5</td>
<td>184</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>142</td>
<td>50.3</td>
<td>142</td>
<td>50.3</td>
<td>124</td>
<td>50.5</td>
<td>142</td>
<td>50.3</td>
<td>142</td>
<td>50.3</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>19.4</td>
<td>616</td>
<td>19.9</td>
<td>600</td>
<td>20.0</td>
<td>598</td>
<td>19.4</td>
<td>616</td>
<td>19.9</td>
<td>600</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>37.7</td>
<td>249</td>
<td>37.7</td>
<td>249</td>
<td>38.1</td>
<td>247</td>
<td>37.7</td>
<td>249</td>
<td>37.7</td>
<td>249</td>
</tr>
<tr>
<td>444.namd</td>
<td>278</td>
<td>28.9</td>
<td>278</td>
<td>28.9</td>
<td>278</td>
<td>28.9</td>
<td>271</td>
<td>29.6</td>
<td>271</td>
<td>29.6</td>
</tr>
<tr>
<td>447.dealII</td>
<td>196</td>
<td>58.5</td>
<td>197</td>
<td>58.1</td>
<td>196</td>
<td>58.5</td>
<td>196</td>
<td>58.1</td>
<td>196</td>
<td>58.5</td>
</tr>
<tr>
<td>450.soplex</td>
<td>229</td>
<td>36.4</td>
<td>227</td>
<td>36.7</td>
<td>228</td>
<td>36.6</td>
<td>229</td>
<td>36.4</td>
<td>227</td>
<td>36.7</td>
</tr>
<tr>
<td>453.povray</td>
<td>93.6</td>
<td>56.9</td>
<td>93.9</td>
<td>56.7</td>
<td>93.8</td>
<td>56.7</td>
<td>82.8</td>
<td>64.2</td>
<td>82.9</td>
<td>64.2</td>
</tr>
<tr>
<td>454.caculix</td>
<td>136</td>
<td>60.8</td>
<td>136</td>
<td>60.8</td>
<td>136</td>
<td>60.8</td>
<td>136</td>
<td>60.8</td>
<td>136</td>
<td>60.8</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>62.6</td>
<td>170</td>
<td>62.6</td>
<td>169</td>
<td>63.0</td>
<td>168</td>
<td>58.1</td>
<td>183</td>
<td>58.2</td>
<td>182</td>
</tr>
<tr>
<td>465.tonto</td>
<td>218</td>
<td>45.2</td>
<td>217</td>
<td>45.3</td>
<td>218</td>
<td>45.2</td>
<td>180</td>
<td>54.7</td>
<td>180</td>
<td>54.6</td>
</tr>
<tr>
<td>470.lbm</td>
<td>25.2</td>
<td>546</td>
<td>25.4</td>
<td>540</td>
<td>25.5</td>
<td>539</td>
<td>25.2</td>
<td>546</td>
<td>25.4</td>
<td>540</td>
</tr>
<tr>
<td>481.wrf</td>
<td>137</td>
<td>81.7</td>
<td>138</td>
<td>80.8</td>
<td>138</td>
<td>80.8</td>
<td>137</td>
<td>81.7</td>
<td>138</td>
<td>80.8</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>295</td>
<td>66.1</td>
<td>293</td>
<td>66.5</td>
<td>299</td>
<td>65.1</td>
<td>295</td>
<td>66.1</td>
<td>293</td>
<td>66.5</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
Uncore Frequency Scaling set to Disable
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4e51ed28d7f98696cbe290c1)
running on linux-yyst Sun Jul 30 21:53:58 2017
Lenovo Global Technology
ThinkSystem SR550
(2.60 GHz, Intel Xeon Silver 4112)

SPECfp2006 = 102
SPECfp_base2006 = 98.8

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Jul-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016

Platform Notes (Continued)
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) Silver 4112 CPU @ 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 1 2 3 4
    physical 1: cores 1 2 4 5
  cache size : 8448 KB

From /proc/meminfo
  MemTotal: 395883484 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*/
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 2
    # 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-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 30 21:50

SPEC is set to: /home/cpu2006-1.2-ic17.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 744G 256G 487G 35% /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
Lenovo Global Technology
ThinkSystem SR550
(2.60 GHz, Intel Xeon Silver 4112)

SPECfp2006 = 102
SPECfp_base2006 = 98.8

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Jul-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016

Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to
hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Lenovo -[TEE105Z-1.00]- 04/27/2017
Memory:
12x Hynix HMA84GR7AFR4N-VK 32 GB 2 rank 2666 MHz, configured at 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 = "8"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
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 -nofor_main
447.dealII: -DSPEC_CPU_LP64

Continued on next page
Lenovo Global Technology
ThinkSystem SR550
(2.60 GHz, Intel Xeon Silver 4112)

SPECfp2006 = 102
SPECfp_base2006 = 98.8

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test date: Jul-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016

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 -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
Lenovo Global Technology
ThinkSystem SR550
(2.60 GHz, Intel Xeon Silver 4112)

SPECfp2006 = 102
SPECfp_base2006 = 98.8

Peak Optimization Flags

C benchmarks:
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.dealII: 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

Continued on next page
### Lenovo Global Technology

**ThinkSystem SR550**  
(2.60 GHz, Intel Xeon Silver 4112)

- **SPECfp2006 =** 102
- **SPECfp_base2006 =** 98.8

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

**Test date:** Jul-2017  
**Hardware Availability:** Aug-2017  
**Software Availability:** Nov-2016

#### Peak Optimization Flags (Continued)

- 454.calculix: `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-auto-ilp32`
- 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/Intel-ic17.0-official-linux64.html)
- [http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.html](http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.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/Intel-ic17.0-official-linux64.xml)
- [http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.xml](http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.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 19 September 2017.