Lenovo Global Technology

ThinkSystem SR630
(2.20 GHz, Intel Xeon Silver 4114)

SPECfp®2006 = 118
SPECfp_base2006 = 114

SPEC® CFP2006 Result
Copyright 2006-2017 Standard Performance Evaluation Corporation

Hardware

CPU Name: Intel Xeon Silver 4114
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip
CPU(s) orderable: 1.2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core

Software

Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64)
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;
Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux
Auto Parallel: Yes
File System: btrfs
System State: Run level 3 (multi-user)
## Lenovo Global Technology

**ThinkSystem SR630**  
(2.20 GHz, Intel Xeon Silver 4114)

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>9017</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>

### SPEC CFP2006 Result

**SPECfp2006 =** 118  
**SPECfp_base2006 =** 114

<table>
<thead>
<tr>
<th>L3 Cache:</th>
<th>13.75 MB I+D on chip per chip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400 MHz)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 800 GB SAS SSD</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

#### 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>19.2</td>
<td>708</td>
<td>19.2</td>
<td>709</td>
<td><strong>19.2</strong></td>
<td><strong>708</strong></td>
<td>19.2</td>
<td>708</td>
<td>19.2</td>
<td>708</td>
</tr>
<tr>
<td>416.gamess</td>
<td>508</td>
<td>38.5</td>
<td>507</td>
<td>38.6</td>
<td><strong>508</strong></td>
<td><strong>38.6</strong></td>
<td>468</td>
<td>41.9</td>
<td>468</td>
<td>41.8</td>
</tr>
<tr>
<td>433.milc</td>
<td><strong>143</strong></td>
<td><strong>64.3</strong></td>
<td>143</td>
<td>64.1</td>
<td>143</td>
<td>64.4</td>
<td><strong>143</strong></td>
<td><strong>64.3</strong></td>
<td>143</td>
<td>64.1</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>41.5</td>
<td>219</td>
<td>42.1</td>
<td>216</td>
<td><strong>41.6</strong></td>
<td><strong>219</strong></td>
<td>41.5</td>
<td>219</td>
<td>42.1</td>
<td>216</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>162</td>
<td>43.9</td>
<td>163</td>
<td>43.9</td>
<td><strong>163</strong></td>
<td><strong>43.9</strong></td>
<td>162</td>
<td>43.9</td>
<td>163</td>
<td>43.9</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td><strong>12.4</strong></td>
<td><strong>963</strong></td>
<td>12.5</td>
<td>953</td>
<td>12.2</td>
<td>981</td>
<td><strong>12.4</strong></td>
<td><strong>963</strong></td>
<td>12.2</td>
<td>981</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>22.5</td>
<td>418</td>
<td>22.6</td>
<td>416</td>
<td>22.6</td>
<td>416</td>
<td>22.5</td>
<td>418</td>
<td>22.6</td>
<td>416</td>
</tr>
<tr>
<td>444.namd</td>
<td>278</td>
<td>28.9</td>
<td>278</td>
<td>28.9</td>
<td><strong>278</strong></td>
<td><strong>28.9</strong></td>
<td>271</td>
<td>29.6</td>
<td>271</td>
<td>29.6</td>
</tr>
<tr>
<td>447.dealII</td>
<td>194</td>
<td>58.9</td>
<td>195</td>
<td>58.8</td>
<td><strong>194</strong></td>
<td><strong>58.8</strong></td>
<td>194</td>
<td>58.9</td>
<td>195</td>
<td>58.8</td>
</tr>
<tr>
<td>450.soplex</td>
<td>214</td>
<td>39.0</td>
<td>212</td>
<td>39.4</td>
<td><strong>213</strong></td>
<td><strong>39.1</strong></td>
<td>214</td>
<td>39.0</td>
<td>212</td>
<td>39.4</td>
</tr>
<tr>
<td>453.povray</td>
<td><strong>94.0</strong></td>
<td><strong>56.6</strong></td>
<td>93.9</td>
<td>56.7</td>
<td>94.0</td>
<td>56.6</td>
<td>82.7</td>
<td>64.3</td>
<td><strong>82.7</strong></td>
<td><strong>64.3</strong></td>
</tr>
<tr>
<td>454.calculix</td>
<td>140</td>
<td>59.0</td>
<td><strong>140</strong></td>
<td><strong>59.1</strong></td>
<td>140</td>
<td>59.1</td>
<td>133</td>
<td>61.9</td>
<td>133</td>
<td>62.0</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>43.1</td>
<td>246</td>
<td><strong>43.4</strong></td>
<td><strong>245</strong></td>
<td>43.9</td>
<td>242</td>
<td>37.0</td>
<td>287</td>
<td>37.3</td>
<td>285</td>
</tr>
<tr>
<td>465.tonto</td>
<td>240</td>
<td>40.9</td>
<td><strong>240</strong></td>
<td><strong>40.9</strong></td>
<td>240</td>
<td>41.1</td>
<td><strong>184</strong></td>
<td><strong>53.6</strong></td>
<td>184</td>
<td>53.6</td>
</tr>
<tr>
<td>470.lbm</td>
<td>12.8</td>
<td>1080</td>
<td>12.8</td>
<td>1070</td>
<td><strong>12.8</strong></td>
<td><strong>1070</strong></td>
<td>12.8</td>
<td>1080</td>
<td>12.8</td>
<td>1070</td>
</tr>
<tr>
<td>481.wrf</td>
<td>118</td>
<td>94.6</td>
<td>113</td>
<td>98.9</td>
<td><strong>118</strong></td>
<td><strong>94.7</strong></td>
<td>118</td>
<td>94.6</td>
<td>113</td>
<td>98.9</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>342</td>
<td>56.9</td>
<td><strong>343</strong></td>
<td><strong>56.9</strong></td>
<td>343</td>
<td>56.8</td>
<td>342</td>
<td>56.9</td>
<td><strong>343</strong></td>
<td><strong>56.9</strong></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:**
- Choose Operating Mode set to Maximum Performance
- Hyper-Threading set to Disable
- LLC dead line alloc set to Disable
- Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
- Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f6f98696cbe290c1)
- running on Cable-SPECcpu2006-SUSE12SP2 Mon Aug 7 04:57:44 2017

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

Continued on next page
Lenovo Global Technology
ThinkSystem SR630
(2.20 GHz, Intel Xeon Silver 4114)

SPECfp2006 = 118
SPECfp_base2006 = 114

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

Test date: Aug-2017
Hardware Availability: Aug-2017
Software Availability: Apr-2017

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) Silver 4114 CPU @ 2.20GHz
2 "physical id"s (chips)
20 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions)
cpu cores : 10
siblings : 10
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
cache size : 14080 KB

From /proc/meminfo
MemTotal: 395893396 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:
Linux Cable-SPECcpu2006-SUSE12SP2 4.4.21-69-default #1 SMP Tue Oct 25
10:58:20 UTC 2016 (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 7 04:56

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 744G 180G 561G 25% /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
Continued on next page
Lenovo Global Technology
ThinkSystem SR630
(2.20 GHz, Intel Xeon Silver 4114)

SPECfp2006 = 118
SPECfp_base2006 = 114

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

Platform Notes (Continued)

hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Lenovo -[IVE109Q-1.00]- 06/28/2017
Memory:
24x Samsung M393A2K43BB1-CTD 16 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-ic17.0u3/lib/ia32:/home/cpu2006-1.2-ic17.0u3/lib/intel64:/home/cpu2006-1.2-ic17.0u3/sh10.2"
OMP_NUM_THREADS = "20"

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
Filesystem page cache cleared with:
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run

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

Continued on next page
Lenovo Global Technology
ThinkSystem SR630
(2.20 GHz, Intel Xeon Silver 4114)

SPECFp2006 = 118
SPECFp_base2006 = 114

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

Base Portability Flags (Continued)

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
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 SR630
(2.20 GHz, Intel Xeon Silver 4114)

SPEC CFP2006 Result

SPECfp2006 = 118
SPECfp_base2006 = 114

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

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) -fn0-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 SR630
(2.20 GHz, Intel Xeon Silver 4114)

SPECfp2006 = 118
SPECfp_base2006 = 114

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

Test date: Aug-2017
Hardware Availability: Aug-2017
Software Availability: Apr-2017

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-revF.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.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-revF.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.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 3 October 2017.