Lenovo Global Technology
ThinkSystem SR630
(2.40 GHz, Intel Xeon Gold 6148)

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

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

CPU Name: Intel Xeon Gold 6148
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 40 cores, 2 chips, 20 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

Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64)
Kernel 4.4.21-69-default
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


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L3 Cache: 27.5 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 800 GB SAS 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>Base</th>
<th>Peak</th>
<th>Base</th>
<th>Peak</th>
<th>Base</th>
<th>Peak</th>
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<td>288</td>
<td>67.7</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 (b5e8d4b4eb51ed28d7f8f89696cbe290c1)
racing on Cable-SPECcpu2006-SUSE12SP2 Tue Jul 18 00:06:58 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
Continued on next page
## Lenovo Global Technology

### ThinkSystem SR630

(2.40 GHz, Intel Xeon Gold 6148)

| SPECfp2006 | 148 |
| SPECfp_base2006 | 141 |

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

---

### Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From `/proc/cpuinfo`

- model name: Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
- 2 "physical id"s (chips)
- 40 "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 : 20
- siblings : 20
- physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
- physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
- cache size : 28160 KB

From `/proc/meminfo`

- MemTotal: 395892352 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 Jul 18 00:06

SPEC is set to: `/home/cpu2006-1.2-ic17.0u3`

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>btrfs</td>
<td>744G</td>
<td>180G</td>
<td>561G</td>
<td>25%</td>
</tr>
</tbody>
</table>

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.
```

Continued on next page
### Lenovo Global Technology

**ThinkSystem SR630**  
(2.40 GHz, Intel Xeon Gold 6148)

**SPECfp2006** = 148  
**SPECfp_base2006** = 141

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>9017</th>
<th>Test date:</th>
<th>Jul-2017</th>
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<tbody>
<tr>
<td>Test sponsor:</td>
<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Aug-2017</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Apr-2017</td>
</tr>
</tbody>
</table>

#### Platform Notes (Continued)

BIOS Lenovo -[IVE109Q-1.00]- 06/28/2017  
Memory:  
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666 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 = "40"

- **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 -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`

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Lenovo Global Technology
ThinkSystem SR630
(2.40 GHz, Intel Xeon Gold 6148)

SPECfp2006 = 148
SPECfp_base2006 = 141

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

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 SR630
(2.40 GHz, Intel Xeon Gold 6148)

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

| SPECfp2006 = | 148  |
| SPECfp_base2006 = | 141 |

**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-ii32

- 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
Lenovo Global Technology
ThinkSystem SR630
(2.40 GHz, Intel Xeon Gold 6148)

SPECfp2006 = 148
SPECfp_base2006 = 141

CPU2006 license: 9017
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Test date: Jul-2017
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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

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 3 October 2017.