Lenovo Global Technology

ThinkSystem SR650
(2.10 GHz, Intel Xeon Platinum 8160T)

SPECfp®2006 = 148
SPECfp_base2006 = 141

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

Hardware

CPU Name: Intel Xeon Platinum 8160T
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2100
FPU: Integrated
CPU(s) enabled: 48 cores, 2 chips, 24 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
(2.10 GHz, Intel Xeon Platinum 8160T)

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
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</tbody>
</table>

**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
- LLC dead line alloc set to Disable
- Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
- Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
- running on Cyborg-SPECCpu2006-SUSE12SP2 Mon Jul 17 15:06:57 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 SR650
(2.10 GHz, Intel Xeon Platinum 8160T)

**SPECfp2006 = 148**

**SPECfp_base2006 = 141**

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

**Platform Notes (Continued)**

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

From /proc/cpuinfo

- model name : Intel(R) Xeon(R) Platinum 8160T CPU @ 2.10GHz
- 2 "physical id"s (chips)
- 48 "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 : 24
  - siblings : 24
  - physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
  - physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
- cache size : 33792 KB

From /proc/meminfo

- MemTotal: 395892648 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 Cyborg-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 17 15:06

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 btrfs 744G 30G 711G 4% /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..."
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 -[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,0,3"
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 = "48"

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

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### Lenovo Global Technology

**ThinkSystem SR650**  
(2.10 GHz, Intel Xeon Platinum 8160T)

<table>
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**CPU2006 license:** 9017  
**Test sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology

#### Base Portability Flags (Continued)

- 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
- 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 SR650
(2.10 GHz, Intel Xeon Platinum 8160T)

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

**CPU2006 license:** 9017
**Test sponsor:** Lenovo Global Technology
**Test date:** Jul-2017
**Tested by:** Lenovo Global Technology
**Hardware Availability:** Aug-2017
**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) -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
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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.

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