Huawei

Huawei 2288H V5 (Intel Xeon Gold 6130T)

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Jul-2018
Hardware Availability: Jul-2017
Software Availability: Feb-2018

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
</tr>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>32</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>32</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>32</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>32</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>32</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>32</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>32</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>32</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>32</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>32</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 6130T
Max MHz.: 3700
Nominal: 2100
Enabled: 32 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 22 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64)
4.4.114-92.64-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Compiler for Linux:
Fortran: Version 18.0.0.128 of Intel Fortran
Compiler for Linux
Parallel: Yes
Firmware: Version 0.62 Released Mar-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
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SPECspeed2017_fp_base = 106

SPECspeed2017_fp_peak = 108

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>485</td>
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<td>607.cactuBSSN_s</td>
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<td>123</td>
<td>136</td>
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<td>137</td>
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<td>628.pop2_s</td>
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<td>638.imagick_s</td>
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<td>161</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>111</td>
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<td>654.roms_s</td>
<td>32</td>
<td>111</td>
<td>141</td>
<td>112</td>
<td>141</td>
<td>111</td>
<td>141</td>
</tr>
</tbody>
</table>

Results Table

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>/proc/sys/vm/drop_caches
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:
Power Policy Set to Load Balance
Hyper-Threading Set to Disable

(Continued on next page)
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<table>
<thead>
<tr>
<th>SPECspeed2017_fp_peak</th>
<th>108</th>
</tr>
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<tbody>
<tr>
<td>SPECspeed2017_fp_base</td>
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</table>

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Jul-2018
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Platform Notes (Continued)

XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-2gz1 Tue Jul 10 03:56:49 2018

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name: Intel(R) Xeon(R) Gold 6130T CPU @ 2.10GHz
2  "physical id"s (chips)
32 "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 : 16
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6130T CPU @ 2.10GHz
Stepping: 4
CPU MHz: 1200.000
CPU max MHz: 2101.0000
CPU min MHz: 1000.0000
BogoMIPS: 4200.03
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)
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Platform Notes (Continued)

pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperf perf eagerfpuf pi pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 sse3 sdbg
fma cx16 xtop pdcie pcdi dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm intel_pt rsb_ctxsx spec_ctrl retpolicy kaiser tpr_shadow vmmi flexpriority
epi vpid fgtsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavex getbv1 cqm_l1c cqm_occu_llc

/proc/cpuinfo cache data
  cache size : 22528 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  node 0 size: 191528 MB
  node 0 free: 190598 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
  node 1 size: 193382 MB
  node 1 free: 192643 MB
  node distances:
    node 0: 10 21
    node 1: 21 10

From /proc/meminfo
  MemTotal: 394149468 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSLEnterprise 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"

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SPECspeak2017_fp_base = 106
SPECspeak2017_fp_peak = 108

Platform Notes (Continued)

uname -a:
    Linux linux-2gz1 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 9 07:55

SPEC is set to: /spec2017
    Filesystem  Type   Size  Used Avail Use% Mounted on
    /dev/sda3    xfs  269G   24G  246G   9%  /

Additional information from dmidecode follows. 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.
    BIOS INSYDE Corp. 0.62 03/26/2018
    Memory: 24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC 619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
==============================================================================

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC 607.cactuBSSN_s(base)
==============================================================================

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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Compiler Version Notes (Continued)

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FC  607.cactuBSSN_s(peak)
==============================================================================
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Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
==============================================================================
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)
==============================================================================
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
==============================================================================
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  621.wrf_s(peak) 628.pop2_s(peak)
==============================================================================
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Base Compiler Invocation

C benchmarks: icc

Fortran benchmarks: ifort

Benchmarks using both Fortran and C: ifort icc

Benchmarks using Fortran, C, and C++: icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks: 
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks: 
-DSPEC_OPENMP -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

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**SPECspeed2017_fp_base = 106**

**SPECspeed2017_fp_peak = 108**

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

Peak Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags
Peak Optimization Flags

C benchmarks:

- 619.lbm_s: basepeak = yes
- 638.imagick_s: basepeak = yes
- 644.nab_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
  -DSPEC_OPENMP

Fortran benchmarks:

- 603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
  -DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3
  -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
  -qopenmp -nostandard-realloc-lhs -align array32byte

- 649.fotonik3d_s: basepeak = yes
- 654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

- 621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
  -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
  -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
  -DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

- 627.cam4_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
  -DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

- 628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

- -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-prefetch
  -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
  -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
  -align array32byte

Peak Other Flags

C benchmarks:

- -m64 -std=c11

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<table>
<thead>
<tr>
<th>SPEC CPU2017 Floating Point Speed Result</th>
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<td>Copyright 2017-2018 Standard Performance Evaluation Corporation</td>
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### Peak Other Flags (Continued)

Fortran benchmarks:

```bash
-m64
```

Benchmarks using both Fortran and C:

```bash
-m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```bash
-m64 -std=c11
```

The flags files that were used to format this result can be browsed at

- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:

- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml)

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

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