Huawei

Huawei G560 V5 (Intel Xeon Gold 6138)

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: Apr-2019
Hardware Availability: Jul-2017
Software Availability: Nov-2018

SPECspeed2017_fp_base = 119
SPECspeed2017_fp_peak = Not Run

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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</thead>
<tbody>
<tr>
<td>bwaves_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>cactuBSSN_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>lbm_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>wrf_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>cam4_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>pop2_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>imagick_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>nab_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>fotonik3d_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>roms_s</td>
<td>40</td>
<td>0</td>
<td>40</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 6138
Max MHz.: 3700
Nominal: 2000
Enabled: 40 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: 27.5 MB I+D on chip per chip
Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 1920 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.6 (Maipo)
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux;
Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux
Parallel: Yes
Firmware: Version 1.09 Released Jan-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
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SPECspeed2017_fp_base = 119
SPECspeed2017_fp_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
<td>131</td>
<td>450</td>
<td>131</td>
<td>451</td>
<td>132</td>
<td>446</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
<td>122</td>
<td>136</td>
<td>124</td>
<td>135</td>
<td>123</td>
<td>136</td>
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<td>619.lbm_s</td>
<td>40</td>
<td>61.1</td>
<td>85.8</td>
<td>61.0</td>
<td>85.8</td>
<td>60.9</td>
<td>85.9</td>
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<tr>
<td>621.wrf_s</td>
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<td>106</td>
<td>126</td>
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<td>627.cam4_s</td>
<td>40</td>
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<td>105</td>
<td>84.5</td>
<td>106</td>
<td>83.8</td>
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<tr>
<td>628.pop2_s</td>
<td>40</td>
<td>185</td>
<td>64.1</td>
<td>185</td>
<td>64.2</td>
<td>188</td>
<td>63.2</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>40</td>
<td>131</td>
<td>110</td>
<td>132</td>
<td>110</td>
<td>131</td>
<td>110</td>
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<tr>
<td>644.nab_s</td>
<td>40</td>
<td>89.6</td>
<td>195</td>
<td>89.5</td>
<td>195</td>
<td>89.9</td>
<td>194</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
<td>115</td>
<td>79.4</td>
<td>115</td>
<td>79.2</td>
<td>117</td>
<td>78.0</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
<td>138</td>
<td>114</td>
<td>138</td>
<td>114</td>
<td>138</td>
<td>114</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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/spec2017/lib/ia32:/spec2017/lib/intel64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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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SPECspeed2017_fp_peak = Not Run

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Platform Notes (Continued)

XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue Apr 9 00:07:01 2019

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 6138 CPU @ 2.00GHz
  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

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 1
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6138 CPU @ 2.00GHz
Stepping: 4
CPU MHz: 2001.000
CPU max MHz: 2001.0000
CPU min MHz: 1000.0000
BogoMIPS: 4000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-19
NUMA node1 CPU(s): 20-39
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)
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**SPEC CPU2017 Floating Point Speed Result**

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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  
aperfmpref eagerfpu pni pclmulqdq dtes64 msr vmx smx est tm2 ssse3 sdbg fma cx16  
xtrn pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave  
avx f16c rdrand lahf_lm abm 3dnowprefetch ebpx cat13 cd_p13 intel_p6 intel_pt ssbd  
mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1  
hle avx2 smep bmi2 erms invpcid rtm cqmx mxp rdt_a avx512f avx512dq rdseed adx smap  
clfshopt clwb avx512cd avx512bw avx512v1 xsaveopt xsavec xgetbv1 cqm_llc  
cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat p1n pts pku ospke spec_ctrl intel_stibp flush_l1d

/proc/cpuinfo cache data  
cache size : 28160 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 16 17 18 19  
node 0 size: 195187 MB  
node 0 free: 186361 MB  
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39  
node 1 size: 196608 MB  
node 1 free: 189397 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10

From /proc/meminfo  
MemTotal: 394621960 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*  
**os-release:**  
NAME="Red Hat Enterprise Linux Server"  
VERSION="7.6 (Maipo)"  
ID="rhel"  
ID_LIKE="fedora"  
VARIANT="Server"  
VARIANT_ID="server"  
VERSION_ID="7.6"  
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"

redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)  
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)  

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Platform Notes (Continued)

uname -a:
    Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
    x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Apr 8 17:44

SPEC is set to: /spec2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4     xfs  300G  6.7G  294G   3% /

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. 1.09 01/31/2019
Memory:
12x NO DIMM NO DIMM
12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  607.cactuBSSN_s(base)
==============================================================================
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
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## SPEC CPU2017 Floating Point Speed Result

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### Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
-----------------------------------------------------------------------------
CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
-----------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

### Base Compiler Invocation

C benchmarks:
```bash
icc -m64 -std=c11
```

Fortran benchmarks:
```bash
ifort -m64
```

Benchmarks using both Fortran and C:
```bash
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```bash
icpc -m64 icc -m64 -std=c11 ifort -m64
```

### Base Portability Flags

- 603.bwaves_s: `-DSPEC_LP64`
- 607.cactuBSSN_s: `-DSPEC_LP64`
- 619.lbm_s: `-DSPEC_LP64`

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<th>Not Run</th>
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<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>No data</td>
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</table>

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<tr>
<th>Test Date:</th>
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</tbody>
</table>

### Base Portability Flags (Continued)

- 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 byteorder
- 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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

**Fortran benchmarks:**
- -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
- nostandard-realloc-lhs

**Benchmarks using both Fortran and C:**
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- nostandard-realloc-lhs

**Benchmarks using Fortran, C, and C++:**
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- nostandard-realloc-lhs

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


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

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

Tested with SPEC CPU2017 v1.0.5 on 2019-04-09 00:07:00-0400.