## SPEC® CPU2017 Floating Point Speed Result

### Cisco Systems

Cisco UCS C240 M5 (Intel Xeon Gold 6138, 2.00 GHz)

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Cisco Systems</th>
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<tbody>
<tr>
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<td>Cisco Systems</td>
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<tr>
<td>CPU2017 License</td>
<td>9019</td>
</tr>
<tr>
<td>Test Date</td>
<td>Jan-2019</td>
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<tr>
<td>Hardware Availability</td>
<td>Aug-2017</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Nov-2018</td>
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### SPECspeed2017_fp_base = 120
SPECspeed2017_fp_peak = Not Run

### Threads

<table>
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<th>Benchmark</th>
<th>Threads</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>40</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>40</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>40</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>40</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>40</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>40</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
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### Hardware

- **CPU Name:** Intel Xeon Gold 6138
- **Max MHz.:** 3700 MHz
- **Nominal:** 2000 MHz
- **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:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)
- **Storage:** 1 x 400 GB SAS SSD
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP2 (x86_64)
  - 4.4.120-92.70-default
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler for Linux;
  - Fortran: Version 19.0.1.144 of Intel Fortran Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Version 4.0.1 released Oct-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
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CPU2017 License: 9019
Test Sponsor: Cisco Systems
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SPECspeed2017_fp_base = 120
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
<td>126</td>
<td>126</td>
<td>468</td>
<td></td>
<td>126</td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
<td>117</td>
<td>117</td>
<td>142</td>
<td></td>
<td>117</td>
<td>143</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>40</td>
<td>58.2</td>
<td>58.2</td>
<td>90.0</td>
<td></td>
<td>58.2</td>
<td>90.0</td>
</tr>
<tr>
<td>621.wrf_s</td>
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<td>125</td>
<td>126</td>
<td>106</td>
<td></td>
<td>126</td>
<td>105</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>40</td>
<td>104</td>
<td>104</td>
<td>85.4</td>
<td></td>
<td>103</td>
<td>85.7</td>
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<tr>
<td>628.pop2_s</td>
<td>40</td>
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<td>206</td>
<td>57.5</td>
<td></td>
<td>207</td>
<td>57.4</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>40</td>
<td>139</td>
<td>138</td>
<td>104</td>
<td></td>
<td>139</td>
<td>104</td>
</tr>
<tr>
<td>644.nab_s</td>
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<td>87.8</td>
<td>87.8</td>
<td>199</td>
<td></td>
<td>87.8</td>
<td>199</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
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<td>113</td>
<td>80.6</td>
<td></td>
<td>117</td>
<td>77.7</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
<td>132</td>
<td>132</td>
<td>120</td>
<td></td>
<td>132</td>
<td>119</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 120
SPECspeed2017_fp_peak = Not Run

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 = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"
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 Settings:
Intel HyperThreading Technology set to Disabled
CPU performance set to Enterprise

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SPEC CPU2017 Floating Point Speed Result

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Hardware Availability: Aug-2017
Software Availability: Nov-2018

Platform Notes (Continued)

Power Performance Tuning set to OS Controls
SNC set to Disabled
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-x58q Sun Jan 27 14:47:22 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: 2045.311
CPU max MHz: 3700.0000
CPU min MHz: 1000.0000
BogoMIPS: 3990.62
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-19

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**Platform Notes (Continued)**

NUMA node1 CPU(s): 20-39

Flags:
fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
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 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pcid 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 hwp hwp_act_window hwp_epp hwp_pkg_req intel_pt rsb_ctxsw spec_ctrl stibp
retptoline kaiser tpr_shadow vmni flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle
avx2 smep bmi2 ibrn invpcid rmtr cmn mpx avx512f avx512dq rdseed adx smap clflushopt
clwvb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

/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: 385626 MB
node 0 free: 381475 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: 387054 MB
node 1 free: 383194 MB

dnode distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 791225144 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"

(Continued on next page)
Platform Notes (Continued)

```
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
    Linux linux-x58q 4.4.120-92.70-default #1 SMP Wed Mar 14 15:59:43 UTC 2018 (52a83de)
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Jan 27 09:46

SPEC is set to: /home/cpu2017
    Filesystem Type  Size  Used Avail Use% Mounted on
    /dev/sda2       xfs   210G   34G  177G  16% /

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 Cisco Systems, Inc. C240M5.4.0.1.139.1003182220 10/03/2018
    Memory:
        24x 0xCE00 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)
==============================================================================
  icc (ICC) 19.0.1.144 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
  FC    607.cactuBSSN_s(base)
==============================================================================
  icpc (ICC) 19.0.1.144 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
  icc (ICC) 19.0.1.144 20181018
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
  ifort (IFORT) 19.0.1.144 20181018
```

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Compiler Version Notes (Continued)

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****************************************************************************
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

****************************************************************************
CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)

ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

****************************************************************************

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

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

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

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.ibm_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

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Base Portability Flags (Continued)

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=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

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:
http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.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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