## SPEC CPU®2017 Floating Point Speed Result

**Cisco Systems**

Cisco UCS B200 M5 (Intel Xeon Gold 6242, 2.80GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>134</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems  
**Test Date:** Aug-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

### Hardware

**CPU Name:** Intel Xeon Gold 6242  
**Max MHz:** 3900  
**Nominal:** 2800  
**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  
**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R)  
**Storage:** 1 x 600 GB 10K RPM SAS  
**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 15 (x86_64)  
**4.12.14-23-default**  
**Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux;  
**Fortran:** Version 19.0.4.227 of Intel Fortran Compiler for Linux  
**Parallel:** Yes  
**Firmware:** Version 4.0.4b released Apr-2019  
**File System:** btrfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None  
**Power Management:** --

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
</tr>
</thead>
<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>
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<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base (134)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
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<tr>
<td>143</td>
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<tr>
<td>99.3</td>
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<tr>
<td>131</td>
</tr>
<tr>
<td>87.8</td>
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<tr>
<td>68.6</td>
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<tr>
<td>114</td>
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<tr>
<td>216</td>
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<tr>
<td>32</td>
</tr>
<tr>
<td>103</td>
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<tr>
<td>162</td>
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SPECspeed®2017_fp_base = 134
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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<td>607.cactuBSSN_s</td>
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<td>143</td>
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<td>143</td>
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<tr>
<td>619.lbm_s</td>
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<td>52.9</td>
<td>98.9</td>
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<tr>
<td>621.wrf_s</td>
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<td>101</td>
<td>130</td>
<td>101</td>
<td>131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>627.cam4_s</td>
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<td>87.8</td>
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<tr>
<td>628.pop2_s</td>
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<td>174</td>
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<td>68.6</td>
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<tr>
<td>638.imagick_s</td>
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<td>127</td>
<td>114</td>
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<td>125</td>
<td>115</td>
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<tr>
<td>644.nab_s</td>
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<td>649.fotonik3d_s</td>
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<td>82.6</td>
<td>109</td>
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<tr>
<td>654.roms_s</td>
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<td>97.4</td>
<td>162</td>
<td>98.4</td>
<td>160</td>
<td></td>
<td></td>
</tr>
</tbody>
</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"
LD_LIBRARY_PATH = ""/home/cpu2017/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

NA: 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

(Continued on next page)
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SPECspeed®2017_fp_base = 134
SPECspeed®2017_fp_peak = Not Run

Platform Notes (Continued)

Power Performance Tuning set to OS Controls
SNC set to Disabled
IMC Interleaving set to Auto
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc91c0f
running on linux-k1c6 Thu Aug 29 04:31:29 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 6242 CPU @ 2.80GHz
  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 6242 CPU @ 2.80GHz
Stepping: 6
CPU MHz: 2800.000
CPU max MHz: 3900.0000
CPU min MHz: 1200.0000
BogoMIPS: 5600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K

(Continued on next page)
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<th>9019</th>
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<tr>
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<td>Hardware Availability:</td>
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### Platform Notes (Continued)

NUMA node0 CPU(s): 0-15  
NUMA node1 CPU(s): 16-31  
Flags:  
- fpu  
- vme  
- de  
- pse  
- tsc  
- mtrr  
- pae  
- mca  
- cmov  
- pat  
- pse36  
- clflush  
- dts  
- acpi  
- mmx  
- fxsr  
- sse  
- sse2  
- ss  
- ht  
- tm  
- pbe  
- syscall  
- nx  
- pdpe1gb  
- rdtscp  
- mce  
- xsave  
- xsavec  
- xgetbv1  
- xsaves  
- cqm_llc  
- cqm_occup_llc  
- cqm_mbm_total  
- cqm_mbm_local  
- ibpb  
- ibrs  
- stibp  
- dtherm  
- ida  
- arat  
- pln  
- pts  
- hwp  
- hwp_act_window  
- hwp_epp  
- hwp_pkg_req  
- pku  
- ospe  
- avx512_vnni  
- arch_capabilities  
- ssbd

/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: 385429 MB  
- node 0 free: 377276 MB  
- node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
- node 1 size: 387045 MB  
- node 1 free: 385575 MB  
- node distances:  
  - node 0 1  
  - 0: 10 21  
  - 1: 21 10

From /proc/meminfo  
- MemTotal: 791014156 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*  
- os-release:  
  - NAME="SLES"  
  - VERSION="15"  
  - VERSION_ID="15"  
  - PRETTY_NAME="SUSE Linux Enterprise Server 15"  
  - ID="sles"  
  - ID_LIKE="suse"  
  - ANSI_COLOR="0;32"  
  - CPE_NAME="cpe:/o:suse:sles:15"

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Platform Notes (Continued)

uname -a:
    Linux linux-k1c6 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 28 22:56

SPEC is set to: /home/cpu2017

FileSystem    Type    Size   Used  Avail Use% Mounted on
/dev/sdc2      btrfs  557G  22G   535G   4%  /home

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. B200M5.4.0.4b.0.0407191258 04/07/2019
    Memory:
        24x 0xCE00 M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)

Compiler Version Notes

C                  | 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

C++, C, Fortran   | 607.cactuBSSN_s(base)
-------------------|-----------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
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Compiler Version Notes (Continued)

Fortran | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Fortran, C | 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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

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

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Base Portability Flags (Continued)

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

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

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

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