Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)

SPECSpeed®2017_fp_base = 101
SPECSpeed®2017_fp_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

Hardware
CPU Name: Intel Xeon Silver 4309Y
Max MHz: 3600
Nominal: 2800
Enabled: 16 cores, 2 chips
Orderable: 1.2 Chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 12 MB I+D on chip per chip
Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC4-3200V-R, running at 2666)
Storage: 1 × 480 GB SATA SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 15 SP2
5.3.18-22-default
Compiler: Fortran: Version 2021.1 of Intel Fortran Compiler
Class Build 20201112 for Linux;
C/C++: Version 2021.1 of Intel C/C++ Compiler
Class Build 20201112 for Linux
Parallel: Yes
Firmware: Version 4.2.1d released Jul-2021
Firmware: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of
additional power usage
**SPEC CPU®2017 Floating Point Speed Result**

Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)

SPECspeed®2017_fp_base = 101
SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

<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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>157</td>
<td>375</td>
<td>157</td>
<td>376</td>
<td>158</td>
<td>374</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>135</td>
<td>123</td>
<td>143</td>
<td>116</td>
<td>136</td>
<td>123</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>16</td>
<td>70.9</td>
<td>73.9</td>
<td>71.1</td>
<td>73.7</td>
<td>71.4</td>
<td>73.3</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>16</td>
<td>127</td>
<td>104</td>
<td>127</td>
<td>104</td>
<td>128</td>
<td>103</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>151</td>
<td>58.6</td>
<td>151</td>
<td>58.6</td>
<td>152</td>
<td>58.4</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>16</td>
<td>188</td>
<td>63.2</td>
<td>186</td>
<td>63.8</td>
<td>188</td>
<td>63.1</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>16</td>
<td>172</td>
<td>84.0</td>
<td>172</td>
<td>84.1</td>
<td>172</td>
<td>83.9</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>16</td>
<td>123</td>
<td>142</td>
<td>123</td>
<td>142</td>
<td>123</td>
<td>142</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td>118</td>
<td>77.0</td>
<td>119</td>
<td>76.6</td>
<td>119</td>
<td>76.7</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
<td>172</td>
<td>91.3</td>
<td>172</td>
<td>91.4</td>
<td>172</td>
<td>91.6</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

**Submit Notes**
The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

**Operating System Notes**
Stack size set to unlimited using "ulimit -s unlimited"

**Environment Variables Notes**
Environment variables set by runcpu before the start of the run:
- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

**General Notes**
Binaries compiled on a system with 1x Intel Core i9–7940X CPU + 64GB RAM
memory using openSUSE Leap 15.2
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
runcpu command invoked through numactl i.e.:
Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)
SPECSpeed®2017_fp_base = 101
SPECSpeed®2017_fp_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

General Notes (Continued)

```bash
numactl --interleave=all runcpu <etc>
```
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 Hyper-Threading Technology set to Disabled
DCU Streamer Prefetch set to Disabled
Memory Refresh Rate set to 1x Refresh
ADDDC Sparing set to Disabled
Patrol Scrub set to Disabled
Energy Efficient Turbo set to Enabled
Processor C6 Report set to Enabled
Processor C1E set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on install Sat Aug 21 14:39:28 2021

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) Silver 4309Y CPU @ 2.80GHz
  2 "physical id"s (chips)
  16 "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 : 8
  siblings : 8
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s) : 32-bit, 64-bit
Byte Order: Little Endian
### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Address sizes:</th>
<th>46 bits physical, 57 bits virtual</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU(s):</td>
<td>16</td>
</tr>
<tr>
<td>On-line CPU(s) list:</td>
<td>0-15</td>
</tr>
<tr>
<td>Thread(s) per core:</td>
<td>1</td>
</tr>
<tr>
<td>Core(s) per socket:</td>
<td>8</td>
</tr>
<tr>
<td>Socket(s):</td>
<td>2</td>
</tr>
<tr>
<td>NUMA node(s):</td>
<td>2</td>
</tr>
<tr>
<td>Vendor ID:</td>
<td>GenuineIntel</td>
</tr>
<tr>
<td>CPU family:</td>
<td>6</td>
</tr>
<tr>
<td>Model:</td>
<td>106</td>
</tr>
<tr>
<td>Model name:</td>
<td>Intel(R) Xeon(R) Silver 4309Y CPU @ 2.80GHz</td>
</tr>
<tr>
<td>Stepping:</td>
<td>6</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>800.870</td>
</tr>
<tr>
<td>CPU max MHz:</td>
<td>3600.00000</td>
</tr>
<tr>
<td>CPU min MHz:</td>
<td>800.000000</td>
</tr>
<tr>
<td>BogoMIPS:</td>
<td>5600.00</td>
</tr>
<tr>
<td>Virtualization:</td>
<td>VT-x</td>
</tr>
<tr>
<td>L1d cache:</td>
<td>48K</td>
</tr>
<tr>
<td>L1i cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L2 cache:</td>
<td>1280K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>12288K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-7</td>
</tr>
<tr>
<td>NUMA nodel CPU(s):</td>
<td>8-15</td>
</tr>
<tr>
<td>Flags:</td>
<td>fpu vme de pse tsc msr 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 cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpmr pdcm pcl ida sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd mba ibrs ibsr enhanced tpr_shadow vmmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  3dnowvpct rtm cmq rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsxsaveopt xsxsave xgetbv1 xsaves cmq llc cmq_occup llc cmq_mbm_total cmq_mbm_local wbenoivvd dtm_th ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfnv vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities</td>
</tr>
</tbody>
</table>

/proc/cpuinfo cache data

```
ctime size : 12288 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
- node 0 size: 1031590 MB
- node 0 free: 1027832 MB

(Continued on next page)
## Platform Notes (Continued)

node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 1032186 MB
node 1 free: 1031083 MB
node distances:
node 0 1
  0: 10 20
  1: 20 10

From /proc/meminfo
MemTotal:       2113307900 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*
    os-release:
      NAME="SLES"
      VERSION="15-SP2"
      VERSION_ID="15.2"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
    Linux install 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x86_64
    x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):

CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

(Continued on next page)
Cisco Systems  
Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)

<table>
<thead>
<tr>
<th>CPU2017 License: 9019</th>
<th>Test Date: Aug-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Cisco Systems</td>
<td>Hardware Availability: Apr-2021</td>
</tr>
<tr>
<td>Tested by: Cisco Systems</td>
<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 101  
SPECspeed®2017_fp_peak = Not Run

Platform Notes (Continued)

run-level 3 Aug 21 12:19

SPEC is set to: /home/cpu2017

Filesystem     Type   Size  Used Avail Use% Mounted on
/dev/sda4      btrfs  445G   19G  425G   5% /home

From /sys/devices/virtual/dmi/id
Vendor:        Cisco Systems Inc
Product:       UCSB-B200-M6
Serial:        FCH24097576

Additional information from dmidecode 3.2 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.

Memory:
32x 0xCE00 M393A8G40AB2-CWE 64 GB 2 rank 3200, configured at 2666

BIOS:
  BIOS Vendor: Cisco Systems, Inc.
  BIOS Version: B200M6.4.2.1d.0.0730210924
  BIOS Date: 07/30/2021
  BIOS Revision: 5.22

(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 Classic for applications running on Intel(R)
  64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
  64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)

SPECSpeed®2017_fp_base = 101
SPECSpeed®2017_fp_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: Aug-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
Fortran | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 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 Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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

(Continued on next page)
Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>101</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: Aug-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

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 byte_recl
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:
-m64 -std=c11 -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries

Fortran benchmarks:
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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/Intel-ic2021-official-linux64_revA.xml
| SPEC CPU®2017 Floating Point Speed Result |

<table>
<thead>
<tr>
<th>Cisco Systems</th>
<th>SPECspeed®2017_fp_base = 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco UCS B200 M6 (Intel Xeon Silver 4309Y, 2.80GHz)</td>
<td>SPECspeed®2017_fp_peak = Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems

**Test Date:** Aug-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Dec-2020

---

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.8 on 2021-08-21 14:39:28-0400.  
Report generated on 2021-09-14 19:19:49 by CPU2017 PDF formatter v6442.  
Originally published on 2021-09-14.