## SPEC CPU®2017 Floating Point Speed Result

**Cisco Systems**

Cisco UCS X210c M6 (Intel Xeon Platinum 8358, 2.60GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>223</td>
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</table>

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems  
**Hardware Availability:** Sep-2021

| Software | OS: SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default  
Compiler: C/C++: Version 2021.4.0 of Intel oneAPI DPC++/C++ Compiler Build 20210924 for Linux; Fortran: Version 2021.4.0 of Intel Fortran Compiler Classic Build 20210910 for Linux; C/C++: Version 2021.4.0 of Intel C/C++ Compiler Classic Build 20210910 for Linux;
| --- | --- |
| Firmware: Version 5.0.1d released Aug-2021  
File System: btrfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: jemalloc memory allocator V5.0.1  
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

### Hardware

| CPU Name: | Intel Xeon Platinum 8358  
Max MHz: | 3400  
Nominal: | 2600  
Enabled: | 64 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: | 48 MB I+D on chip per chip  
Other: | None  
Memory: | 2 TB (32 x 64 GB 2Rx4 PC4-3200AA-R)  
Storage: | 1 x 240 GB M.2 SSD SATA  
Other: | None

### Software

| Test Date: | Dec-2021  
Hardware Availability: | Sep-2021

| Test Sponsor: | Cisco Systems  
Tested by: | Cisco Systems

| Threads | 0 30.0 70.0 130 190 250 310 370 430 490 550 610 670 730 790 850 910 970 1030 1100 1170 1230 1300 1370 1430 1500 1570 1630 1700 1770 1830 1900 1970 2030 2100 2170 2230 2300 2370 2430 2500 2570 2630 2700 2770 2840 2900 2970 3030 3100 3160 3230 3300 3370 3430 3500 3570 3630 3700 3770 3830 3900 3970 4030 4100 4170 4230 4300 4370 4430 4500 4570 4630 4700 4770 4830 4900 4970 5030 5100 5170 5230 5300 5370 5430 5500 5570 5630 5700 5770 5830 5900 5970 6030 6090 6160 6230 6290 6360 6420 6490 6560 6620 6690 6760 6830 6890 6960 7030 7100 7160 7230 7300 7370 7430 7500
| SPECspeed®2017_fp_base (222) | SPECspeed®2017_fp_peak (223)

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**SPECspeed®2017_fp_base** = 222
**SPECspeed®2017_fp_peak** = 223

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"

### Environment Variables Notes

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

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8358, 2.60GHz)

SPECspeed®2017_fp_base = 222
SPECspeed®2017_fp_peak = 223

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

Test Date: Dec-2021
Hardware Availability: Sep-2021
Software Availability: Sep-2021

Platform Notes

BIOS Settings:
Adjacent Cache Line Prefetcher set to Disabled
DCU Streamer Prefetch set to Disabled
Sub NUMA Clustering set to Enabled
LLC Dead Line set to Disabled
Memory Refresh Rate set to 1x Refresh
ADDDC Sparing set to Disabled
Patrol Scrub set to Disabled
Intel Hyper-Threading Technology set to Disable
Processor C6 Report set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d
running on perf-blade2 Wed Dec 15 08:32:37 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) Platinum 8358 CPU @ 2.60GHz
  2 "physical id"s (chips)
  64 "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 : 32
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 57 bits virtual
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 1
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz

(Continued on next page)
Cisco Systems
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SPECspeed®2017_fp_base = 222
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Platform Notes (Continued)

Stepping:  6
CPU MHz:  956.683
CPU max MHz:  3400.0000
CPU min MHz:  800.0000
BogoMIPS:  5200.00
Virtualization: VT-x
L1d cache:  48K
L1i cache:  32K
L2 cache:  1280K
L3 cache:  49152K
NUMA node0 CPU(s):  0-31
NUMA node1 CPU(s):  32-63
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 cpuid
aperfmperf 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 cpuid_fault epb cat_l3 invpcid_single ssbd
mqa ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqms rt_q aavx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512vl xsavesopt xsaveopt xsave xsetbv1 xsaves xcm llc xcm_occult llc xcm mbm total
xcm mbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp epp
hwp_pkg_req avx512vbmi umip pku ospke avx512 vbmi2 gfni vaes vpclmulqdq avx512 vnii
avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush llid
arch_capabilities

/proc/cpuinfo cache data
    cache size: 49152 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 20 21 22 23 24 25 26 27
    28 29 30 31
    node 0 size: 1031777 MB
    node 0 free: 1025011 MB
    node 1 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56
    57 58 59 60 61 62 63
    node 1 size: 1032146 MB
    node 1 free: 1030889 MB
    node distances:
    node 0 1
    0: 10 20
    1: 20 10

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Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8358, 2.60GHz)  

**SPECspeed®2017_fp_base = 222**

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### Platform Notes (Continued)

MemTotal: 2113458748 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

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

From /etc/*release* /etc/*version*

```plaintext
os-release:
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANCE_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"
```

uname -a:

```
Linux perf-blade2 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):** Mitigation: usercopy/swapgs barriers and __user pointer sanitization
- **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

run-level 3 Dec 15 03:40

SPEC is set to: /home/cpu2017

Filesystem     Type     Size  Used Avail Use% Mounted on
/dev/sda4      btrfs     218G  49G  170G   23% /home

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Tested by: Cisco Systems

Platform Notes (Continued)

Product: UCSX-210C-M6
Serial: FCH250671KR

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

BIOS:
BIOS Vendor: Cisco Systems, Inc.
BIOS Version: X210M6.5.0.1d.0.0816211754
BIOS Date: 08/16/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
644.nab_s(base)

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.4.0 Build 20210910_000000
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

C | 644.nab_s(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.4.0 Build 20210924
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
644.nab_s(base)

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.4.0 Build 20210910_000000
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Compiler Version Notes (Continued)

C               | 644.nab_s(peak)
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.4.0 Build 20210924
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

C++, C, Fortran | 607.cactuBSSN_s(base, peak)
Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on
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Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
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Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, 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:
-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/home/cpu2017/je5.0.1-64 -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
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Cisco UCS X210c M6 (Intel Xeon Platinum 8358, 2.60GHz)

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<td>Cisco Systems</td>
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<td>Tested by:</td>
<td>Cisco Systems</td>
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<tr>
<td>Test Date:</td>
<td>Dec-2021</td>
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<tr>
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<td>Sep-2021</td>
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<td>Sep-2021</td>
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### Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

```bash
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/home/cpu2017/je5.0.1-64 -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```bash
-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/home/cpu2017/je5.0.1-64 -ljemalloc
```

### Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
icc
644.nab_s: icx
```

Fortran benchmarks:

```bash
ifort
```

Benchmarks using both Fortran and C:

```bash
ifort icc
```

Benchmarks using Fortran, C, and C++:

```bash
icpc icc ifort
```

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

C benchmarks:

```bash
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -fiopenmp
```

(Continued on next page)
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8358, 2.60GHz)

<table>
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<th>Peak Optimization Flags (Continued)</th>
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<td>644.nab_s (continued):</td>
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<tr>
<td>-DSPEC_OPENMP -qopt-mem-layout-trans=4</td>
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<tr>
<td>-fimf-accuracy-bits=14:sqrt</td>
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<tr>
<td>-mbranches-within-32B-boundaries</td>
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<tr>
<td>-L/home/cpu2017/je5.0.1-64</td>
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<td>-ljemalloc</td>
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</table>

Fortran benchmarks:

-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX2
-03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -gopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries -L/home/cpu2017/je5.0.1-64

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries -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.