# SPEC CPU®2017 Integer Speed Result

## Cisco Systems

Cisco UCS C220 M6 (Intel Xeon Gold 5320, 2.20GHz)

**SPECspeed®2017_int_base = 11.4**

### Hardware

- **CPU Name:** Intel Xeon Gold 5320
- **Max MHz:** 3400
- **Nominal:** 2200
- **Enabled:** 52 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:** 39 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200V-R, running at 2933)
- **Storage:** 1 x 240 GB SATA SSD
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default
- **Compiler:** C/C++ Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;
  Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;
- **Parallel:** Yes
- **Firmware:** Version 4.2.1c released Jul-2021
- **File System:** 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

### Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>52</td>
<td>6.94</td>
<td>Not Run</td>
</tr>
<tr>
<td>602.gcc_s</td>
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</tr>
<tr>
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<td>52</td>
<td>18.8</td>
<td></td>
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| SPECspeed®2017_int_base = 11.4 |
| SPECspeed®2017_int_peak = Not Run |

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

### Results Table

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**SPECspeed®2017_int_base = 11.4**  
**SPECspeed®2017_int_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"

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

- KMP_AFFINITY = "granularity=fine,scatter"
- 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 i9-7980XE 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

(Continued on next page)
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**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Test Date:** Aug-2021  
**Hardware Availability:** Jun-2021  
**Tested by:** Cisco Systems  
**Software Availability:** Dec-2020

### General Notes (Continued)


### Platform Notes

BIOS Settings:
- Adjacent Cache Line Prefetcher set to Disabled
- DCU Streamer Prefetch set to Disabled
- UPI Link Enablement set to 1
- UPI Power Management set to Enabled
- Sub NUMA Clustering set to Disabled
- LLC Dead Line set to Disabled
- Memory Refresh Rate set to 1x Refresh
- ADDDC Spacing set to Disabled
- Patrol Scrub set to Disabled
- Enhanced CPU performance set to Auto
- Energy Efficient Turbo set to Enabled
- Processor C6 Report set to Enabled
- Processor C1E set to Enabled
- Intel Hyper-Threading Technology set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 9b2a6f10c8b5891ef0e16a6c64d  
running on localhost Thu Aug 19 04:07:10 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

```plaintext
model name : Intel(R) Xeon(R) Gold 5320 CPU @ 2.20GHz
  2 "physical id"s (chips)
  52 "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 : 26
siblings : 26
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
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
```

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
```

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Platform Notes (Continued)

CPU(s): 52
On-line CPU(s) list: 0-51
Thread(s) per core: 1
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 5320 CPU @ 2.20GHz
Stepping: 6
CPU MHz: 1677.383
CPU max MHz: 3400.0000
CPU min MHz: 800.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 39936K
NUMA node0 CPU(s): 0-25
NUMA node0 CPU(s): 26-51
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc 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 dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmexit flexpriority ept vpid ept_ad fsgbase tsc_adjust bmi1 hle avx2 smep bmi2 512 emms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsavec cqm_llc cqm_occup_llc cqm_mbms cqm_mbm_local wbnoinvd dtmerr ida arat pln pts hwp hwp_act_window hwp_epf hwp_pkg_req avx512vpt mimp kpu ospke avx512_vbmi2 gfn nvaes vpcmnlqldq avx512_vnni avx512_vbitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

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
node 0 size: 515610 MB
node 0 free: 514914 MB
node 1 cpus: 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

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Platform Notes (Continued)

51
node 1 size: 515778 MB
node 1 free: 515285 MB
node distances:
node 0  1
  0:  10  20
  1:  20  10

From /proc/meminfo
MemTotal:       1056142288 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 localhost 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/swaps 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
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Platform Notes (Continued)

run-level 3 Aug 19 04:06

SPEC is set to: /home/cpu2017
Filesysten Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 222G 34G 188G 16% /home

From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSC-C220-M6S
Serial: WZP24430N7F

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 M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2933

BIOS:
BIOS Vendor: Cisco Systems, Inc.
BIOS Version: C220M6.4.2.1c.1.0701210708
BIOS Date: 07/01/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)
|         | 625.x264_s(base) 657.xz_s(base)
==============================================================================

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
|         | 641.leela_s(base)
==============================================================================

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
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Compiler Version Notes (Continued)

Fortran | 648.exchange2_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.

Base Compiler Invocation

C benchmarks:
icx
C++ benchmarks:
icpx
Fortran benchmarks:
ifort

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX512
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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### Base Optimization Flags (Continued)

**C++ benchmarks:**
-DSPEC_OPENMP  
-m64 -Wl,-z,muldefs  
-xCORE-AVX512 -O3 -ffast-math  
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/  
-1qkmalloc

**Fortran benchmarks:**
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs -align array32byte -auto  
-mbranches-within-32B-boundaries

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.

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