Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Gold 6338, 2.00GHz)

SPEC 2017 Floating Point Speed Result

CPU2017 License: 9019  Test Date:  Nov-2021
Test Sponsor: Cisco Systems  Hardware Availability: Sep-2021
Tested by: Cisco Systems  Software Availability: Sep-2021

Threads

| SPECspeed\^\text{2017\_fp\_base} & SPECspeed\^\text{2017\_fp\_peak} |
|-------------------|-------------------|
| 603.bwaves_s 64   | 247               |
| 607.cactuBSSN_s 64| 738               |
| 619.ibm_s 64      | 135               |
| 621.wrf_s 64      | 187               |
| 627.cam4_s 64     | 149               |
| 628.pop2_s 64     | 80.3              |
| 638.imagick_s 64  | 227               |
| 644.nab_s 64      | 356               |
| 649.fotonik3d_s 64| 172               |
| 654.roms_s 64     | 271               |

**Hardware**

CPU Name: Intel Xeon Gold 6338  
Max MHz: 3200  
Nominal: 2000  
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**

OS: SUSE Linux Enterprise Server 15 SP3  
5.3.18-57-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;  
Parallel: Yes  
Firmware: Version 5.0.1d released Aug-2021  
File System: xfs  
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
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Results Table

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<th>Benchmark</th>
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<th>Ratio</th>
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<td>79.7</td>
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<td>67.8</td>
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<td>356</td>
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<td>356</td>
<td>49.0</td>
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<td>64</td>
<td>46.6</td>
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<td>46.6</td>
<td>375</td>
<td>46.6</td>
<td>375</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>81.6</td>
<td>112</td>
<td>82.5</td>
<td>110</td>
<td>81.0</td>
<td>113</td>
<td>64</td>
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<td>80.2</td>
<td>114</td>
<td>81.8</td>
<td>111</td>
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<tr>
<td>654.roms_s</td>
<td>64</td>
<td>58.1</td>
<td>271</td>
<td>58.1</td>
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<td>58.1</td>
<td>271</td>
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<td>271</td>
<td>58.1</td>
<td>271</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/intel/tbb/2021.4.0/env/..//lib/intel64/gcc4.8:/home/intel/mpi/2021.4.0//libfabric/lib:/home/intel/mpi/2021.4.0//lib/release:/home/intel/mpi/2021.4.0//lib:/home/intel/compiler/2021.4.0//linux/compiler/lib/intel64/_lin:/home/intel/compiler/2021.4.0//linux/lib:/home/intel/clck/2021.4.0//lib/intel64/cpu2017/jes5.0.1-64"
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

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## SPEC CPU®2017 Floating Point Speed Result

**Cisco Systems**

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<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tbody>
<tr>
<td>206</td>
<td>207</td>
</tr>
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</table>

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

## General Notes (Continued)

- Transparent Huge Pages enabled by default
- Prior to runcpu invocation:
  - sync; echo 3> /proc/sys/vm/drop_caches
  - runcpu command invoked through numactl i.e.:
    - 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:**
- Adjacent Cache Line Prefetcher set to Disabled
- DCU Streamer Prefetch set to Disabled
- 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 Disabled

**Sysinfo program** /home/cpu2017/bin/sysinfo  
**Rev:** r6622 of 2021-04-07 982a61ec0915b55891ef0e16acfc64d  
**running on perf-bladel Mon Nov 29 05:56:32 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) Gold 6338 CPU @ 2.00GHz  
  - 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

(Continued on next page)
Platform Notes (Continued)

From lscpu from util-linux 2.36.2:

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) Gold 6338 CPU @ 2.00GHz
Stepping: 6
CPU MHz: 2751.914
CPU max MHz: 3200.0000
CPU min MHz: 800.0000
BogoMIPS: 4000.00
Virtualization: VT-x
L1d cache: 3 MiB
L1i cache: 2 MiB
L2 cache: 80 MiB
L3 cache: 96 MiB
NUMA node0 CPU(s): 0-31
NUMA node1 CPU(s): 32-63
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected
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 pdeldbg rdtsc lp 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 xtrunc pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abmm 3dnowprefetch cpuid_fault

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Cisco UCX 210c M6 (Intel Xeon Gold 6338, 2.00GHz)

SPECspeed®2017_fp_base = 206
SPECspeed®2017_fp_peak = 207

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: Nov-2021
Hardware Availability: Sep-2021
Software Availability: Sep-2021

Platform Notes (Continued)

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 48K 3M 12 Data 1 64 1 64
L1i 32K 2M 8 Instruction 1 64 1 64
L2 1.3M 80M 20 Unified 2 1024 1 64
L3 48M 96M 12 Unified 3 65536 1 64

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: 1031743 MB
node 0 free: 1029690 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: 1032180 MB
node 1 free: 1025517 MB
node distances:
node   0   1
 0:  10  20
 1:  20  10

From /proc/meminfo
MemTotal:       2113458424 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release*/etc/*version*
NAME="SLES"
VERSION="15-SP3"

(Continued on next page)
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Gold 6338, 2.00GHz)

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SPECspeed®2017_fp_base = 206
SPECspeed®2017_fp_peak = 207

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

Platform Notes (Continued)

VERSION_ID="15.3"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp3"

uname -a:
    Linux perf-blade1 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021 (ba3c2e9)
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 Nov 24 21:13

SPEC is set to: /home/cpu2017
    Filesystem  Type  Size  Used Avail Use% Mounted on
    /dev/sda3  xfs  181G  59G  123G  33%  /home

From /sys/devices/virtual/dmi/id
    Vendor: Cisco Systems Inc
    Product: UCSX-210C-M6
    Serial: FCH25057AMV

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:

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Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Gold 6338, 2.00GHz)

**SPECspeed®2017_fp_base = 206**
**SPECspeed®2017_fp_peak = 207**

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(End of data from sysinfo program)

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<th>Compiler Version Notes</th>
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<td>C</td>
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<tr>
<td>Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.4.0 Build 20210910_000000</td>
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<tr>
<td>Copyright (C) 1985-2021 Intel Corporation. All rights reserved.</td>
</tr>
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| 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 |
| 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++, C, Fortran       | 607.cactuBSSN_s(base, peak) |

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Compiler Version Notes (Continued)

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.

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.

Intel(R) Fortran 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.

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

Peak Compiler Invocation

C benchmarks (except as noted below):
icc

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Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Gold 6338, 2.00GHz) SPECspeed®2017_fp_base = 206
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Test Date: Nov-2021
Hardware Availability: Sep-2021
Software Availability: Sep-2021

Peak Compiler Invocation (Continued)

644.nab_s: icx
Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX2 -O3 -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 -ljemalloc
649.fotonik3d_s: Same as 603.bwaves_s

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Peak Optimization Flags (Continued)

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)
 -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div
 -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
 -mbranches-within-32B-boundaries -nostandard-realloc-lhs
 -L/home/cpu2017/je5.0.1-64 -ljemalloc

627.cam4_s: basepeak = yes
628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

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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