Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8352M, 2.30GHz)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base =</th>
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<tbody>
<tr>
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</tbody>
</table>

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

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<tr>
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<tr>
<td>554.roms_r</td>
<td>128</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8352M
- **Max MHz:** 3300
- **Nominal:** 2300
- **Enabled:** 64 cores, 2 chips, 2 threads/core
- **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
- **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 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;
- **Parallel:** No
- **Firmware:** Version 5.0.1d released Aug-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
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8352M, 2.30GHz)

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<td>157</td>
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<td>156</td>
<td>1297</td>
<td>157</td>
</tr>
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</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:

```
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/mp
i/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/l
ib/intel64:/home/cpu2017/je5.0.1-32"
MALLOC_CONF = "retain:true"
```
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8352M, 2.30GHz)

SPEC CPU®2017 Floating Point Rate Result

SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = Not Run

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

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.:
numatl --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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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
ADDC Sparing set to Disabled
Patrol Scrub set to Disabled
Processor C6 Report set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acacfc64d
running on perf-blade6 Wed Dec 15 18:57:42 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 8352M CPU @ 2.30GHz
   2 "physical id"s (chips)
   128 "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 : 64

(Continued on next page)
Cisco Systems
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Hardware Availability: Sep-2021
Software Availability: Sep-2021

Platform Notes (Continued)

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
dp

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
dp

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): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8352M CPU @ 2.30GHz
Stepping: 6
CPU MHz: 3445.421
CPU max MHz: 3500.0000
CPU min MHz: 800.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s): 0-15,64-79
NUMA node1 CPU(s): 16-31,80-95
NUMA node2 CPU(s): 32-47,96-111
NUMA node3 CPU(s): 48-63,112-127

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 nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrp pdcm pcid dca ssse4_1 ssse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsv f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd
mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occu llc cqm_mbm_total
cqm_mbb_local wbinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
hwp_pkg_req avx512v bmi umip pku ospke avx512_v bmi2 gfni vaes vpclmulqdq avx512_vnni
avx512_bitalg tme avx512 vpocndq la57 rdpid md_clear pconfig flush_l1d

(Continued on next page)
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8352M, 2.30GHz)

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

Platform Notes (Continued)

```
/arch_capabilities

/cache_data
  cache size : 49152 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
    node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 64 65 66 67 68 69 70 71 72 73 74 75
               76 77 78 79
    node 0 size: 515682 MB
    node 0 free: 515249 MB
    node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88
               89 90 91 92 93 94 95
    node 1 size: 516088 MB
    node 1 free: 515605 MB
    node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102
               103 104 105 106 107 108 109 110 111
    node 2 size: 516088 MB
    node 2 free: 515749 MB
    node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117
               118 119 120 121 122 123 124 125 126 127
    node 3 size: 516050 MB
    node 3 free: 515745 MB

/node distances:
    node 0 1 2 3
    0: 10 11 20 20
    1: 11 10 20 20
    2: 20 20 10 11
    3: 20 20 11 10

From /proc/meminfo
  MemTotal: 2113443016 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"
```

(Continued on next page)
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8352M, 2.30GHz)  

**SPEC CPU®2017 Floating Point Rate Result**

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**SPECrate®2017_fp_base = 404**

**SPECrate®2017_fp_peak = Not Run**

---

**Platform Notes (Continued)**

```
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
  Linux perf-blade6 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): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
CVE-2019-11135 (TSX Asynchronous Abort):

run-level 3 Dec 15 18:55

SPEC is set to: /home/cpu2017
  Filesystem  Type  Size  Used  Avail  Use%  Mounted on
  /dev/sda2    btrfs  222G  41G  181G  19%  /home

From /sys/devices/virtual/dmi/id
  Vendor: Cisco Systems Inc
  Product: UCSX-210C-M6
  Serial: FCH25057ANW

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
```

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(Continued on next page)
Cisco Systems
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Hardware Availability: Sep-2021
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Platform Notes (Continued)

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C                      | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
| 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++                     | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
| 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                  | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
| 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          | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
| Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, |
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Compiler Version Notes (Continued)

```
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
Eric 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.
```

```
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
ERIC 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:
- icx

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

Benchmarks using both Fortran and C:
- ifort icx

Benchmarks using both C and C++:
- icpx icx

Benchmarks using Fortran, C, and C++:
- icpx icx ifort

Base Portability Flags

- 503.bwaves_r: -DSPEC_LP64
- 507.cactuBSSN_r: -DSPEC_LP64

(Continued on next page)
Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8352M, 2.30GHz)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2022 Standard Performance Evaluation Corporation

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SPECrate®2017_fp_base = 404
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Base Portability Flags (Continued)

508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
542.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc -L/home/cpu2017/je5.0.1-64

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc -L/home/cpu2017/je5.0.1-64

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries -ljemalloc -L/home/cpu2017/je5.0.1-64

Benchmarks using both Fortran and C:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -ljemalloc -L/home/cpu2017/je5.0.1-64

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc -L/home/cpu2017/je5.0.1-64

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![SPEC CPU®2017 Floating Point Rate Result](https://www.spec.org)

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<tr>
<th>SPECrate®2017_fp_base</th>
<th>404</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

### Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-Ofast`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-O3`  
- `-no-prec-div`  
- `-qopt-prefetch`  
- `-ffinite-math-only`  
- `-qopt-multiple-gather-scatter-by-shuffles`  
- `-mbranches-within-32B-boundaries`  
- `-nostandard-realloc-lhs`  
- `-align array32byte`  
- `-ljemalloc`  
- `-L/home/cpu2017/je5.0.1-64`

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.

Tested with SPEC CPU®2017 v1.1.8 on 2021-12-15 21:57:41-0500.  
Originally published on 2022-01-04.