Cisco Systems
Cisco UCS X210c M6 (Intel Xeon Platinum 8362, 2.80GHz)

| SPECrate®2017_int_base | 496 |
| SPECrate®2017_int_peak | Not Run |

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

<table>
<thead>
<tr>
<th>Copies</th>
<th>Test Date: Dec-2021</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>Test Date: Dec-2021</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>Test Date: Dec-2021</td>
</tr>
<tr>
<td>505.mcf_r</td>
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<tr>
<td>531.deepsjeng_r</td>
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</tr>
<tr>
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<tr>
<td>548.exchange2_r</td>
<td>Test Date: Dec-2021</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>Test Date: Dec-2021</td>
</tr>
</tbody>
</table>

Hardware
CPU Name: Intel Xeon Platinum 8362
Max MHz: 3600
Nominal: 2800
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
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 SP2
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: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage
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SPECrate®2017_int_base = 496
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>404</td>
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<td>402</td>
<td>364</td>
<td>403</td>
</tr>
<tr>
<td>541.leela_r</td>
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<td>539</td>
<td>393</td>
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<td>394</td>
<td>540</td>
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<td>1060</td>
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<td>277</td>
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<td>277</td>
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SPECCPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: Dec-2021
Hardware Availability: Sep-2021
Software Availability: Sep-2021

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/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:/home/cpu2017/je5.0.1-32"
MALLOCS_CONF = "retain:lower"

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

(Continued on next page)
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SPECRate®2017_int_base = 496
SPECRate®2017_int_peak = Not Run

Test Date: Dec-2021
Hardware Availability: Sep-2021
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General Notes (Continued)

Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numacl 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
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
Processor C6 Report set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acfc64d
running on perf-blade3 Wed Dec 15 15:40:46 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 8362 CPU @ 2.80GHz
  2 "physical id"s (chips)
  128 "processors"
core, 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
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:

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

- **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 8362 CPU @ 2.80GHz
- **Stepping**: 6
- **CPU MHz**: 3552.789
- **CPU max MHz**: 3600.0000
- **CPU min MHz**: 800.0000
- **BogoMIPS**: 5600.00
- **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 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 mba ibrs ibpb stibp ibrs_enabled tpr_shadow vmiidea flexpriority ept vpid ept_ad fs translation 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 xsavesopt xsaveopt xsavec xsavec1 xsaves crqm llc cqm_occup_llc cqm_mbm_total cqm_mbb_local wbnoivd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkreq avx512pub mc lwp umip pku ospke avx512 bvmi2 qfn vaes vpcmcmdq avx512_vnni avx512 bitalg tme avx512 vpctndq ld57 rdpid md_clear pconfig flush_l1d arch_capabilities

From numactl --hardware

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

WARNING: a numactl 'node' might or might not correspond to a physical chip.

<table>
<thead>
<tr>
<th>Available</th>
<th>Node 0</th>
<th>Node 1</th>
<th>Node 2</th>
<th>Node 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>cpus</td>
<td>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 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 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>size</td>
<td>515682 MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>free</td>
<td>515337 MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cpus</td>
<td>16 17 18 19 20 21 22 23 24 25 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 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>size</td>
<td>516088 MB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>free</td>
<td>515585 MB</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>cpus</td>
<td>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 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79</td>
<td></td>
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<tr>
<td>size</td>
<td>516088 MB</td>
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<td></td>
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</tr>
<tr>
<td>free</td>
<td>515799 MB</td>
<td></td>
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<tr>
<td>cpus</td>
<td>48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79</td>
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<tr>
<td>size</td>
<td>516050 MB</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>free</td>
<td>515737 MB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 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: 2113443220 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor`

- 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 perf-blade3 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba)
  - x86_64 x86_64 x86_64 GNU/Linux

(Continued on next page)
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Platform Notes (Continued)

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): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Dec 15 15:37

SPEC is set to: /home/cpu2017

From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSX-210C-M6
Serial: FCH25057ALS

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)
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</table>

**Compiler Version Notes**

```plaintext
---
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
        | 525.x264_r(base) 557.xz_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++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
        | 541.leela_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.
---
Fortran | 548.exchange2_r(base)
---
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:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

**Base Portability Flags**

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64

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**Base Portability Flags (Continued)**

523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
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541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

---

**Base Optimization Flags**

C benchmarks:
- -w -std=c11 -m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries
- -L/home/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin
- -lqkmalloc

C++ benchmarks:
- -w -m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries
- -L/home/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin
- -lqkmalloc

Fortran benchmarks:
- -w -m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ipo -no-prec-div
- -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
- -mbranches-within-32B-boundaries
- -L/home/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin
- -lqkmalloc

---

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/Cisco-Platform-Settings-V1.0-ICX-revl.xml
# SPEC CPU®2017 Integer Rate Result

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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 18:40:45-0500.  
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