Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Gold 6248, 2.50GHz)

SPECrate®2017_int_base = 246
SPECrate®2017_int_peak = 256

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

Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Hardware
CPU Name: Intel Xeon Gold 6248
Max MHz: 3900
Nominal: 2500
Enabled: 40 cores, 2 chips, 2 threads/core
Orderable: 1.2 Chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 27.5 MB I+D on chip per chip
Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R)
Storage: 1 x 1.9 TB SSD SAS
Other: None

Software
OS: SUSE Linux Enterprise Server 15 (x86_64)
4.12.14-23-default
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++
Compiler for Linux;
Fortran: Version 19.0.4.227 of Intel Fortran
Compiler for Linux
Parallel: No
Firmware: Version 4.0.4b released Apr-2019
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: --
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Gold 6248, 2.50GHz)
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SPEC CPU®2017 Integer Rate Result
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General Notes (Continued)

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:
Intel HyperThreading Technology set to Enabled
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd8f2999c33d61f64985e45859ea9
running on linux-eqnk Wed Jun 5 20:45:56 2019

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 6248 CPU @ 2.50GHz
  2 "physical id"s (chips)
  80 "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 : 20
siblings : 40
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 2
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6248 CPU @ 2.50GHz
Stepping: 6

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

## Cisco Systems

**Cisco UCS B200 M5 (Intel Xeon Gold 6248, 2.50GHz)**

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### SPECrate®2017_int_base = 246

SPECrate®2017_int_peak = 256

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## Platform Notes (Continued)

- **CPU MHZ:** 2500.000
- **CPU max MHZ:** 3900.0000
- **CPU min MHZ:** 1000.0000
- **BogoMIPS:** 5000.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 28160K
- **NUMA node0 CPU(s):** 0, 1, 2, 5, 6, 10, 11, 12, 15, 16, 40, 41, 42, 45, 46, 50, 51, 52, 55, 56
- **NUMA node1 CPU(s):** 3, 4, 7, 13, 14, 17, 19, 43, 44, 47, 49, 53, 54, 55, 57, 59
- **NUMA node2 CPU(s):** 20, 21, 22, 25, 30, 31, 32, 35, 36, 60, 61, 62, 65, 66, 70, 71, 72, 75, 76
- **NUMA node3 CPU(s):** 23, 24, 27, 29, 33, 34, 37, 39, 63, 64, 67, 69, 73, 74, 77, 79
- **Flags:** fpv uvm de pse tsc mshr pae mce cx8 apic sep mtrr pge mca cmov
- **/proc/cpuinfo cache data**
  
  ```
  cache size : 28160 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 5 6 10 11 12 15 16 40 41 42 45 46 50 51 52 55 56
  - node 0 size: 192094 MB
  - node 0 free: 191687 MB
  - node 1 cpus: 3 4 7 8 9 13 14 17 18 19 43 44 47 48 49 53 54 57 58 59
  - node 1 size: 193525 MB
  - node 1 free: 193281 MB
  - node 2 cpus: 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 75 76
  - node 2 size: 193496 MB
  - node 2 free: 193267 MB
  - node 3 cpus: 23 24 27 28 29 33 34 37 38 39 63 64 67 68 69 73 74 77 78 79
  - node 3 size: 193522 MB
  - node 3 free: 193277 MB

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**SPEC CPU®2017 Integer Rate Result**

**Cisco Systems**
Cisco UCS B200 M5 (Intel Xeon Gold 6248, 2.50GHz)

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**Platform Notes (Continued)**

1: 11 10 21 21  
2: 21 21 10 11  
3: 21 21 11 10

From /proc/meminfo  
MemTotal: 791182388 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*  
os-release:  
NAME="SLES"  
VERSION="15"  
VERSION_ID="15"  
PRETTY_NAME="SUSE Linux Enterprise Server 15"  
ID="sles"  
ID_LIKE="suse"  
ANSI_COLOR="0;32"  
CPE_NAME="cpe:/o:suse:sles:15"

uname -a:  
Linux linux-eqnk 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)  
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected  
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization  
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Jun 5 19:49

SPEC is set to: /home/cpu2017  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sdb2 btrfs 221G 58G 163G 27% /home

Additional information from dmidecode 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.  
BIOS Cisco Systems, Inc. B200M5.4.0.4b.0.0407191258 04/07/2019  
Memory:  
24x 0xCE00 M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Gold 6248, 2.50GHz)

CPU2017 License: 9019
Test Sponsor: Cisco Systems
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Compiler Version Notes

==============================================================================
C     | 502.gcc_r(peak)
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 
19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C     | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, 
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, 
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++    | 523.xalancbmk_r(peak)
Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 
19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++    | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,

(Continued on next page)
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Gold 6248, 2.50GHz)

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**Compiler Version Notes (Continued)**

Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

```
==============================================================================
C++     | 523.xalancbmk_r(peak)
Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
```

```
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
```

```
Fortran | 548.exchange2_r(base, peak)
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

C benchmarks:
```
icc -m64 -std=c11
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

**Base Portability Flags**

```
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
```

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### Base Portability Flags (Continued)

- 502.gcc_r: -DSPEC_LP64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
- 525.x264_r: -DSPEC_LP64
- 531.deepsjeng_r: -DSPEC_LP64
- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**

- -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
- -lqkmalloc

**C++ benchmarks:**

- -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
- -lqkmalloc

**Fortran benchmarks:**

- -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
- -lqkmalloc

### Peak Compiler Invocation

**C benchmarks (except as noted below):**

```bash
icc -m64 -std=c11
```


**C++ benchmarks (except as noted below):**

```bash
icpc -m64
```

- 523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin

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CPU2017 License: 9019
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Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Fortran benchmarks:
ifort -m64

Peak Compiler Invocation ( Continued )

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/jqe5.0.1-32/lib -ljemalloc

505.mcf_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

557.xz_r: Same as 505.mcf_r

(Continued on next page)
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Peak Optimization Flags (Continued)

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-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:

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Tested with SPEC CPU®2017 v1.0.5 on 2019-06-05 23:45:55-0400.