Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Bronze 3204, 1.90GHz)

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<tr>
<td>SPECrate®2017_int_peak</td>
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**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems  
**Test Date:** Aug-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

| Copies | 0 | 4.0 | 8.0 | 12.0 | 16.0 | 20.0 | 24.0 | 28.0 | 32.0 | 36.0 | 40.0 | 44.0 | 48.0 | 52.0 | 56.0 | 60.0 | 64.0 | 68.0 | 72.0 | 76.0 | 80.0 | 84.0 |
|--------|---|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 500. perlbench_r | 12 |  |  |     |     |     | 32.2|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 502. gcc_r      | 12 |  |  |     |     |     | 37.5|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 505. mcf_r      | 12 |  |  |     |     |     | 50.2|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 520. omnetpp_r  | 12 |  |  |     |     |     | 29.1|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 523. xalancbmk_r | 12 |  |  |     |     |     | 49.0|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 525. x264_r     | 12 |  |  |     |     |     | 79.7|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 531. deepsjeng_r | 12 |  |  |     |     |     | 32.5|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 541. leela_r    | 12 |  |  |     |     |     | 27.1|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 548. exchange2_r | 12 |  |  |     |     |     | 32.2|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 557. xz_r       | 12 |  |  |     |     |     | 23.5|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**Hardware**

- **CPU Name:** Intel Xeon Bronze 3204  
- **Max MHz:** 1900  
- **Nominal:** 1900  
- **Enabled:** 12 cores, 2 chips  
- **Orderable:** 1.2 chips  
- **Cache L1:** 32 KB I+ 32 KB D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 8.25 MB I+D on chip per chip  
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R, running at 2133)  
- **Storage:** 1 x 1.2 TB SAS 7.2K RPM  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)  
- **Version:** 4.12.14-23-default  
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 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:** Not Applicable  
- **Other:** None  
- **Power Management:** --
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SPECrates
SPECrates®2017_int_base = 40.1
SPECrates®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>500.perlbench_r</td>
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<td>32.2</td>
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<td>592</td>
<td>32.3</td>
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<tr>
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<tr>
<td>541.leela_r</td>
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<tr>
<td>548.exchange2_r</td>
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<td>23.5</td>
<td>552</td>
<td>23.5</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"

General Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"

Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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.:
umactl --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)

(Continued on next page)
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SPECrate®2017_int_base = 40.1
SPECrate®2017_int_peak = Not Run

General Notes (Continued)

is mitigated in the system as tested and documented.

Platform Notes

BIOS Settings:

CPU performance set to Enterprise
Power Performance Tuning set to OS Controls
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b6cc091c0f
running on linux-5vrl Fri Aug 30 13:42:32 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) Bronze 3204 CPU @ 1.90GHz
  2 "physical id"s (chips)
  12 "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 : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3204 CPU @ 1.90GHz
Stepping: 6
CPU MHz: 1900.000

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Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

CPU max MHz: 1900.0000
CPU min MHz: 800.0000
BogoMIPS: 3800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-5
NUMA node1 CPU(s): 6-11
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdhg fma cx16 xtpz pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
From /proc/cpuinfo cache data
        cache size : 8448 KB

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
  node 0 size: 386534 MB
  node 0 free: 386080 MB
  node 1 cpus: 6 7 8 9 10 11
  node 1 size: 387047 MB
  node 1 free: 386619 MB
  node distances:
   node  0  1
  0: 10 21
  1: 21 10

From /proc/meminfo
MemTotal: 792147732 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
 os-release:

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**Platform Notes (Continued)**

```shell
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-5vrl 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux`

`run-level 3 Aug 30 13:27`

**Compiler Version Notes**

```
C  | 500.perlbench_r(base)  502.gcc_r(base)  505.mcf_r(base)
   | 525.x264_r(base)  557.xz_r(base)
-----------------------------------------------
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++ | 520.omnetpp_r(base)  523.xalancbmk_r(base)  531.deepsjeng_r(base)
   | 541.leela_r(base)
-----------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
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Compiler Version Notes (Continued)

Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
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
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

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### Base Optimization Flags (Continued)

C benchmarks (continued):
- `-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`

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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