Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Gold 6338T, 2.10GHz)  

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: SUSE Linux Enterprise Server 15 SP2</td>
<td>CPU Name: Intel Xeon Gold 6338T</td>
</tr>
<tr>
<td>Compiler: C/C++ Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux</td>
<td>Max MHz: 3400</td>
</tr>
<tr>
<td>Firmware: Version 4.2.1d released Jul-2021</td>
<td>Enabled: 48 cores, 2 chips</td>
</tr>
<tr>
<td>File System: btrfs</td>
<td>Other: None</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Memory: 2 TB (32 x 64 GB 2Rx4 PC4-3200V-R)</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>Storage: 1 x 480 GB SATA SSD</td>
</tr>
<tr>
<td>Peak Pointers: Not Applicable</td>
<td>Other: None</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
<td>Power Management: BIOS and OS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

| Test Date: Aug-2021 | Test Sponsor: Cisco Systems |
| Hardware Availability: Apr-2021 | Tested by: Cisco Systems |
| Software Availability: Dec-2020 | CPU2017 License: 9019 |

| SPECspeed®2017_int_base = 11.4 | SPECspeed®2017_int_peak = Not Run |

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Threads</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perbench_s</td>
<td>11.4</td>
<td>48</td>
<td>6.95</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>10.5</td>
<td>48</td>
<td>5.77</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>19.1</td>
<td>48</td>
<td>4.75</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>10.3</td>
<td>48</td>
<td>5.77</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>16.5</td>
<td>48</td>
<td>5.77</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>16.5</td>
<td>48</td>
<td>5.77</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>5.77</td>
<td>48</td>
<td>4.75</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>18.9</td>
<td>48</td>
<td>5.77</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>18.9</td>
<td>48</td>
<td>5.77</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>22.6</td>
<td>48</td>
<td>5.77</td>
</tr>
</tbody>
</table>

---

Software
OS: SUSE Linux Enterprise Server 15 SP2
Compiler: C/C++ Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux
Firmware: Version 4.2.1d released Jul-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
## SPEC CPU®2017 Integer Speed Result

**Cisco Systems**

Cisco UCS B200 M6 (Intel Xeon Gold 6338T, 2.10GHz)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>48</td>
<td>255</td>
<td>6.96</td>
<td>257</td>
<td>6.90</td>
<td>255</td>
<td>6.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gcc_s</td>
<td>48</td>
<td>379</td>
<td>10.5</td>
<td>379</td>
<td>10.5</td>
<td>380</td>
<td>10.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mcf_s</td>
<td>48</td>
<td>251</td>
<td>18.8</td>
<td>247</td>
<td>19.1</td>
<td>248</td>
<td>19.1</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>omnetpp_s</td>
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<td>164</td>
<td>9.93</td>
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<td>10.6</td>
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<td>10.3</td>
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<td></td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>48</td>
<td>109</td>
<td>13.0</td>
<td>109</td>
<td>13.0</td>
<td>109</td>
<td>13.1</td>
<td></td>
<td></td>
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<td>x264_s</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>48</td>
<td>248</td>
<td>5.77</td>
<td>248</td>
<td>5.77</td>
<td>248</td>
<td>5.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>leela_s</td>
<td>48</td>
<td>361</td>
<td>4.73</td>
<td>359</td>
<td>4.73</td>
<td>359</td>
<td>4.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exchange2_s</td>
<td>48</td>
<td>156</td>
<td>18.9</td>
<td>156</td>
<td>18.9</td>
<td>156</td>
<td>18.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xz_s</td>
<td>48</td>
<td>273</td>
<td>22.6</td>
<td>271</td>
<td>22.8</td>
<td>273</td>
<td>22.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base** = 11.4

**SPECspeed®2017_int_peak** = Not Run

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,scatter"
- LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
- 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

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.:

(Continued on next page)
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SPECspeed®2017_int_base = 11.4
SPECspeed®2017_int_peak = Not Run

General Notes (Continued)

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:
Intel Hyper-Threading Technology set to Disabled
DCU Streamer Prefetch set to Disabled
Memory Refresh Rate set to 1x Refresh
ADDDC Sparing set to Disabled
Patrol Scrub set to Disabled
Energy Efficient Turbo set to Enabled
Processor C6 Report set to Enabled
Processor C1E set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d running on install Mon Aug 23 00:02:20 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 6338T CPU @ 2.10GHz
  2 "physical id"s (chips)
  48 "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 : 24
siblings : 24
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
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

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian

(Continued on next page)
Cisco Systems
Cisco UCS B200 M6 (Intel Xeon Gold 6338T, 2.10GHz)

Platform Notes (Continued)

Address sizes: 46 bits physical, 57 bits virtual
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6338T CPU @ 2.10GHz
Stepping: 6
CPU MHz: 800.000
CPU max MHz: 3400.0000
CPU min MHz: 800.0000
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s): 0-23
NUMA nodel CPU(s): 24-47
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 pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrr 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 _13 invpcid_single ssbd
mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
fsalgo base tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmq rdt _a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm _occup llc cqm mbm_total
cq_mbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act _window hwp_epp
hwp_pkg_req avx512vbmi umip pku ospke avx512_vbm i2 gfn i vaes vpclmulqdq avx512_vnni
avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d
arch_capabilities

/proc/cpuinfo cache data
  cache size: 36864 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 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
  node 0 size: 1031620 MB
  node 0 free: 1030933 MB

(Continued on next page)
Cisco Systems
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SPECspeed®2017_int_base = 11.4
SPECspeed®2017_int_peak = Not Run

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

Test Date: Aug-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Platform Notes (Continued)

node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 1 size: 1032148 MB
node 1 free: 1031665 MB
node distances:
node 0 1
  0: 10 20
  1: 20 10

From /proc/meminfo
MemTotal: 2113299900 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*

uname -a:
Linux install 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): 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/swaps 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

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

run-level 3 Aug 22 23:52

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda4</td>
<td>btrfs</td>
<td>445G</td>
<td>16G</td>
<td>428G</td>
<td>4%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSB-B200-M6
Serial: FCH24097576

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: B200M6.4.2.1d.0.0730210924
- BIOS Date: 07/30/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)

### Compiler Version Notes

---
C
600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)
625.x264_s(base) 657.xz_s(base)
---

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
---

C++
620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
641.leela_s(base)
---

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
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(Continued on next page)
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Test Date: Aug-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

==============================================================================
Fortran | 648.exchange2_s(base)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX512
-03 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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

C++ benchmarks:
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flt0 -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
-lqkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries

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/Intel-ic2021-official-linux64_revA.xml

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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 2021-08-23 00:02:19-0400.
Originally published on 2021-09-14.