



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C240 M6 (Intel Xeon Platinum 8368Q, 2.60GHz)

SPECrate®2017_int_base = 546

SPECrate®2017_int_peak = Not Run

CPU2017 License: 9019

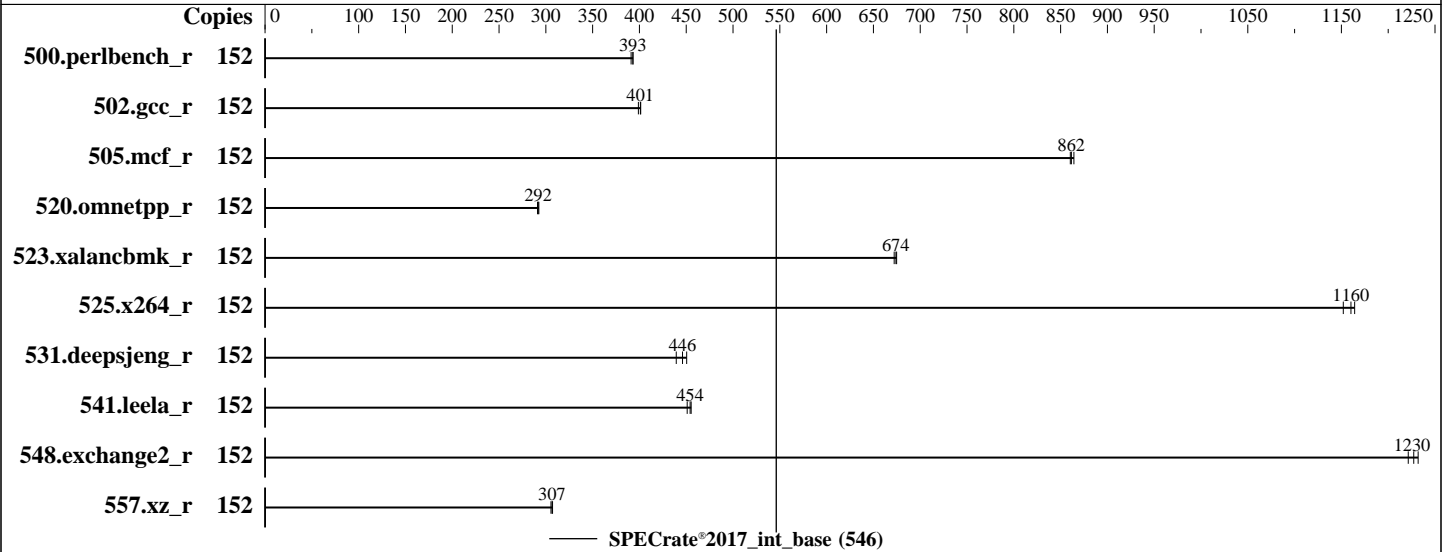
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Jul-2021

Hardware Availability: Apr-2021

Software Availability: Mar-2021



Hardware

CPU Name: Intel Xeon Platinum 8368Q
 Max MHz: 3700
 Nominal: 2600
 Enabled: 76 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: 57 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 SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default
 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;
 Parallel: No
 Firmware: Version 4.2.1c released Jul-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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Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|-----------------|--------|------------|-------------|------------|-------------|------------|------------|--------|---------|-------|---------|-------|---------|-------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 500.perlbench_r | 152 | 616 | 393 | 619 | 391 | 615 | 393 | | | | | | | |
| 502.gcc_r | 152 | 536 | 401 | 537 | 401 | 540 | 399 | | | | | | | |
| 505.mcf_r | 152 | 284 | 864 | 285 | 860 | 285 | 862 | | | | | | | |
| 520.omnetpp_r | 152 | 685 | 291 | 683 | 292 | 682 | 293 | | | | | | | |
| 523.xalancbmk_r | 152 | 238 | 674 | 238 | 675 | 239 | 672 | | | | | | | |
| 525.x264_r | 152 | 229 | 1160 | 229 | 1160 | 231 | 1150 | | | | | | | |
| 531.deepsjeng_r | 152 | 387 | 450 | 391 | 446 | 396 | 439 | | | | | | | |
| 541.leela_r | 152 | 553 | 455 | 554 | 454 | 558 | 451 | | | | | | | |
| 548.exchange2_r | 152 | 323 | 1230 | 324 | 1230 | 326 | 1220 | | | | | | | |
| 557.xz_r | 152 | 535 | 307 | 534 | 307 | 537 | 305 | | | | | | | |

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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/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
MALLOC_CONF = "retain:true"

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

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General Notes (Continued)

runcpu command invoked through numactl 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
UPI Link Enablement set to 1
UPI Power Management set to Enabled
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
Enhanced CPU performance set to Auto
Energy Efficient Turbo set to Enabled
Processor C6 Report set to Enabled
Processor ClE set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on install Fri Jul 16 19:47:37 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 8368Q CPU @ 2.60GHz
 2 "physical id"s (chips)
152 "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      : 38
siblings       : 76
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 32 33 34 35 36 37
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 32 33 34 35 36 37
```

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Platform Notes (Continued)

```

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):                 152
On-line CPU(s) list:   0-151
Thread(s) per core:    2
Core(s) per socket:    38
Socket(s):              2
NUMA node(s):          2
Vendor ID:              GenuineIntel
CPU family:             6
Model:                  106
Model name:             Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz
Stepping:               6
CPU MHz:                800.063
CPU max MHz:            3700.0000
CPU min MHz:            800.0000
BogoMIPS:               5200.00
Virtualization:         VT-x
L1d cache:              48K
L1i cache:              32K
L2 cache:               1280K
L3 cache:               58368K
NUMA node0 CPU(s):     0-37,76-113
NUMA node1 CPU(s):     38-75,114-151
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
aperfmpperf 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_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_occup_llc cqm_mbm_total
cqm_mbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d
arch_capabilities

```

```
/proc/cpuinfo cache data
cache size : 58368 KB
```

```
From numactl --hardware
```

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Platform Notes (Continued)

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 24 25 26 27 28 29 30 31 32 33 34 35 36 37 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113

node 0 size: 1031767 MB

node 0 free: 1030843 MB

node 1 cpus: 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 75 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151

node 1 size: 1032136 MB

node 1 free: 1031470 MB

node distances:

```
node  0  1
  0:  10  20
  1:  20  10
```

From /proc/meminfo

MemTotal: 2113437760 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"

ANSI_COLOR="0;32"

CPE_NAME="cpe:/o:suse:sles:15:sp2"

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

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Platform Notes (Continued)

| | |
|--|--|
| CVE-2018-3639 (Speculative Store Bypass): | Mitigation: Speculative Store Bypass disabled via prctl and seccomp |
| CVE-2017-5753 (Spectre variant 1): | Mitigation: usercopy/swapgs 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 |

run-level 3 Jul 16 19:45

SPEC is set to: /home/cpu2017

| | | | | | | |
|------------|-------|------|------|-------|------|------------|
| Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
| /dev/sda2 | btrfs | 222G | 15G | 206G | 7% | /home |

```
From /sys/devices/virtual/dmi/id
Vendor:      Cisco Systems Inc
Product:     UCSC-C240-M6SX
Serial:      WZP24440K0A
```

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:     C240M6.4.2.1c.1.0701210708
 BIOS Date:        07/01/2021
 BIOS Revision:    5.22
```

(End of data from sysinfo program)

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) 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.
```

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Compiler Version Notes (Continued)

```

=====
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 2021.1 Build 20201113
Copyright (C) 1985-2020 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 2021.1 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

```

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

```



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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/opt/intel/oneapi/compiler/2021.1.1/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/opt/intel/oneapi/compiler/2021.1.1/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  
-auto -mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmalloc
```

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.0-ICX-revF.html>

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

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.0-ICX-revF.xml>

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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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