SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Huawei

(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

$SPECrate®2017\_int\_base =$ 755

$SPECrate®2017\_int\_peak =$ Not Run

CPU2017 License: 6177	**Test Date:** Apr-2021
Test Sponsor: China Academy of Information and Communications Technology	**Hardware Availability:** Nov-2020
Tested by: China Academy of Information and Communications Technology	**Software Availability:** Mar-2021

Copies

- 500.perlbench_r 224 — 535
- 502.gcc_r 224 — 545
- 505.mcf_r 224 — 1210
- 520.omnetpp_r 224 — 442
- 523.xalancbmk_r 224 — 942
- 525.x264_r 224 — 1650
- 531.deepsjeng_r 224 — 619
- 541.leela_r 224 — 594
- 548.exchange2_r 224 — 1490
- 557.xz_r 224 — 457

SPECrate®2017_int_base (755)

Hardware

CPU Name: Intel Xeon Platinum 8376HL
 Max MHz: 4300
 Nominal: 2600
Enabled: 112 cores, 4 chips, 2 threads/core
Orderable: 2,4 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 38.5 MB I+D on chip per chip
 Other: None
Memory: 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)
Storage: 1 x 3.84 TB SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP2(x86_64)
 Kernel 5.3.18-22-default
Compiler: C/C++: Version 2021.2.0 of Intel oneAPI
 DPC++/C++ Compiler
 Build 20210317 for Linux;
 Fortran: Version 2021.2.0 of Intel Fortran
 Compiler Classic Build 20210228 for Linux;
 C/C++: Version 2021.2.0 of Intel C/C++ Compiler
 Classic Build 20210228 for Linux;
Parallel: No
Firmware: Version 0.55 released Dec-2020
File System: xfs
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS set to prefer performance at the cost of
 additional power usage.

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

SPECrate®2017_int_base = 755

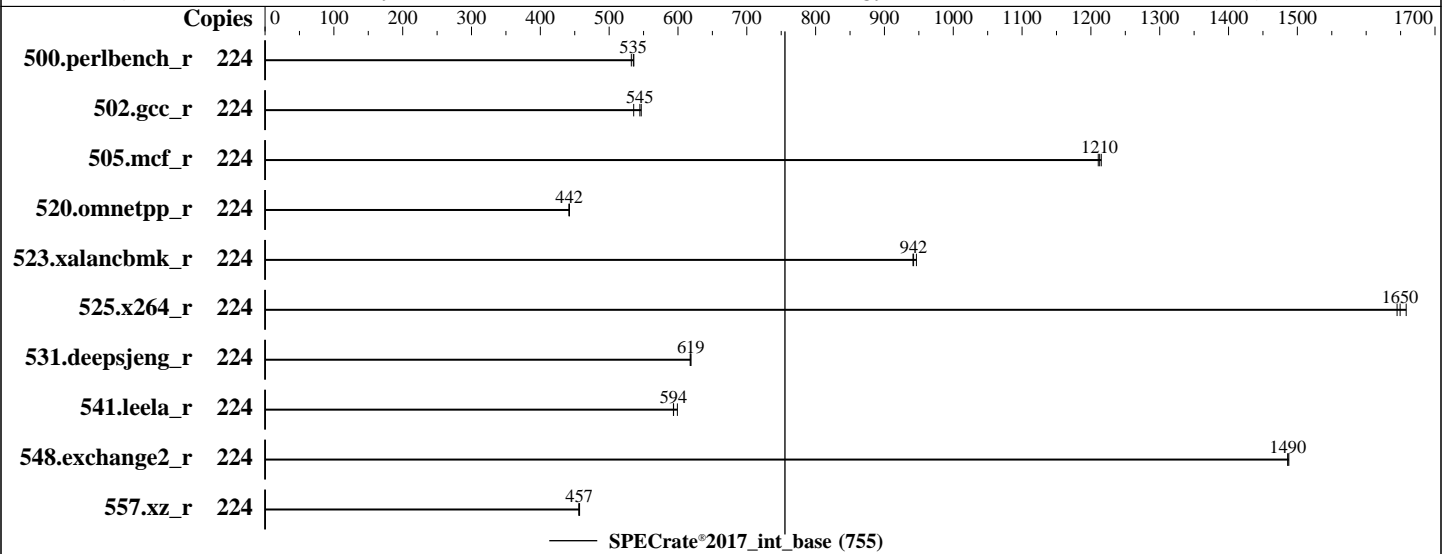SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177
Test Sponsor: China Academy of Information and Communications Technology
Tested by: China Academy of Information and Communications Technology

Test Date: Apr-2021
Hardware Availability: Nov-2020
Software Availability: Mar-2021

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	224	**666**	**535**	670	532	665	536							
502.gcc_r	224	592	536	580	547	**582**	**545**							
505.mcf_r	224	**298**	**1210**	298	1220	299	1210							
520.omnetpp_r	224	665	442	665	442	**665**	**442**							
523.xalancbmk_r	224	**251**	**942**	250	946	251	941							
525.x264_r	224	237	1660	238	1640	**238**	**1650**							
531.deepsjeng_r	224	415	619	416	618	**415**	**619**							
541.leela_r	224	**625**	**594**	619	599	625	593							
548.exchange2_r	224	**395**	**1490**	395	1490	395	1490							
557.xz_r	224	**530**	**457**	531	456	529	457							
SPECrate®2017_int_base =		**755**												
SPECrate®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"
SCALING_GOVERNOR set to powersave

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/opt/intel/oneapi/compiler/2021.2.0/linux/compiler/lib/intel64:/opt/int
     el/oneapi/compiler/2021.2.0/linux/compiler/lib/ia32:/usr/local/jemalloc3
     2-5.0.1"
MALLOC_CONF = "retain:true"

General Notes

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

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base =   755

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)   SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:**	Apr-2021
Test Sponsor:	China Academy of Information and Communications Technology	**Hardware Availability:**	Nov-2020
Tested by:	China Academy of Information and Communications Technology	**Software Availability:**	Mar-2021

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 configuration:
Power Policy Set to Performance
SNC Set to Enabled
XPT Prefetch Set to Enabled

Sysinfo program /home/spec2017115/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost Fri Apr 23 11:43:47 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 8376HL CPU @ 2.60GHz
      4  "physical id"s (chips)
      224 "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 : 28
      siblings  : 56
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
      28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
      28 29 30
      physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
      28 29 30
      physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
      28 29 30

From lscpu:
     Architecture:        x86_64
     CPU op-mode(s):      32-bit, 64-bit
     Byte Order:          Little Endian
     Address sizes:       46 bits physical, 48 bits virtual
```

(Continued on next page)

Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

SPECrate®2017_int_base =   755

SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:** Apr-2021
Test Sponsor: China Academy of Information and Communications Technology		**Hardware Availability:** Nov-2020
Tested by: China Academy of Information and Communications Technology		**Software Availability:** Mar-2021

Platform Notes (Continued)

```
        CPU(s):              224
        On-line CPU(s) list: 0-223
        Thread(s) per core:  2
        Core(s) per socket:  28
        Socket(s):           4
        NUMA node(s):        8
        Vendor ID:           GenuineIntel
        CPU family:          6
        Model:               85
        Model name:          Intel(R) Xeon(R) Platinum 8376HL CPU @ 2.60GHz
        Stepping:            11
        CPU MHz:             2600.019
        CPU max MHz:         4300.0000
        CPU min MHz:         1000.0000
        BogoMIPS:            5200.00
        Virtualization:      VT-x
        L1d cache:           32K
        L1i cache:           32K
        L2 cache:            1024K
        L3 cache:            39424K
        NUMA node0 CPU(s):   0-3,7-9,14-17,21-23,112-115,119-121,126-129,133-135
        NUMA node1 CPU(s):   4-6,10-13,18-20,24-27,116-118,122-125,130-132,136-139
        NUMA node2 CPU(s):   28-31,35-37,42-45,49-51,140-143,147-149,154-157,161-163
        NUMA node3 CPU(s):   32-34,38-41,46-48,52-55,144-146,150-153,158-160,164-167
        NUMA node4 CPU(s):   56-59,63-65,70-73,77-79,168-171,175-177,182-185,189-191
        NUMA node5 CPU(s):   60-62,66-69,74-76,80-83,172-174,178-181,186-188,192-195
        NUMA node6 CPU(s):   84-87,91-93,98-101,105-107,196-199,203-205,210-213,217-219
        NUMA node7 CPU(s):   88-90,94-97,102-104,108-111,200-202,206-209,214-216,220-223
        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 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 cdp_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 mpx rdt_a avx512f
    avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
    xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
    avx512_bf16 dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d
    arch_capabilities

 /proc/cpuinfo cache data
    cache size : 39424 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
    available: 8 nodes (0-7)
```

(Continued on next page)

Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

SPECrate®2017_int_base = 755

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:**	Apr-2021
Test Sponsor:	China Academy of Information and Communications Technology	**Hardware Availability:**	Nov-2020
Tested by:	China Academy of Information and Communications Technology	**Software Availability:**	Mar-2021

Platform Notes (Continued)

```
    node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23 112 113 114 115 119 120 121 126 127 128
    129 133 134 135
    node 0 size: 192068 MB
    node 0 free: 190865 MB
    node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 116 117 118 122 123 124 125 130 131
    132 136 137 138 139
    node 1 size: 193529 MB
    node 1 free: 193227 MB
    node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 140 141 142 143 147 148 149 154
    155 156 157 161 162 163
    node 2 size: 193495 MB
    node 2 free: 193311 MB
    node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 144 145 146 150 151 152 153 158
    159 160 164 165 166 167
    node 3 size: 193529 MB
    node 3 free: 193343 MB
    node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79 168 169 170 171 175 176 177 182
    183 184 185 189 190 191
    node 4 size: 193529 MB
    node 4 free: 193310 MB
    node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83 172 173 174 178 179 180 181 186
    187 188 192 193 194 195
    node 5 size: 193529 MB
    node 5 free: 193323 MB
    node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107 196 197 198 199 203 204 205
    210 211 212 213 217 218 219
    node 6 size: 193529 MB
    node 6 free: 193345 MB
    node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111 200 201 202 206 207 208
    209 214 215 216 220 221 222 223
    node 7 size: 193240 MB
    node 7 free: 193038 MB
    node distances:
    node   0   1   2   3   4   5   6   7
      0:  10  11  20  20  20  20  20  20
      1:  11  10  20  20  20  20  20  20
      2:  20  20  10  11  20  20  20  20
      3:  20  20  11  10  20  20  20  20
      4:  20  20  20  20  10  11  20  20
      5:  20  20  20  20  11  10  20  20
      6:  20  20  20  20  20  20  10  11
      7:  20  20  20  20  20  20  11  10

  From /proc/meminfo
    MemTotal:       1583565656 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB
```

(Continued on next page)

Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

SPECrate®2017_int_base =   755

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)   SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:**	Apr-2021
Test Sponsor:	China Academy of Information and Communications Technology	**Hardware Availability:**	Nov-2020
Tested by:	China Academy of Information and Communications Technology	**Software Availability:**	Mar-2021

Platform Notes (Continued)

```
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
   powersave

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 localhost 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/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 5 Apr 23 11:37

SPEC is set to: /home/spec2017115
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda3       xfs   2.2T   77G  2.1T   4% /home

From /sys/devices/virtual/dmi/id
   Vendor:         Huawei
   Product:        2488H V6
   Product Family: Cedar Island
   Serial:         Huawei
```

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base =   755

SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:**	Apr-2021
Test Sponsor:	China Academy of Information and Communications Technology	**Hardware Availability:**	Nov-2020
Tested by:	China Academy of Information and Communications Technology	**Software Availability:**	Mar-2021

Platform Notes (Continued)

```
 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.
   Memory:
     48x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200

 BIOS:
   BIOS Vendor:      ByoSoft
   BIOS Version:     0.55
   BIOS Date:        12/16/2020

 (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 2021.2.0 Build 20210317
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 2021.2.0 Build 20210317
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 2021.2.0 Build 20210228_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

SPECrate®2017_int_base = 755

SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:**	Apr-2021
Test Sponsor:	China Academy of Information and Communications Technology	**Hardware Availability:**	Nov-2020
Tested by:	China Academy of Information and Communications Technology	**Software Availability:**	Mar-2021

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`

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/2021.2.0/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/opt/intel/oneapi/compiler/2021.2.0/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
-auto -mbranches-within-32B-boundaries
```

(Continued on next page)

Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

SPECrate®2017_int_base = 755

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

SPECrate®2017_int_peak = Not Run

CPU2017 License: 6177		**Test Date:**	Apr-2021
Test Sponsor:	China Academy of Information and Communications Technology	**Hardware Availability:**	Nov-2020
Tested by:	China Academy of Information and Communications Technology	**Software Availability:**	Mar-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-L/opt/intel/oneapi/compiler/2021.2.0/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_revC.html
http://www.spec.org/cpu2017/flags/CAICT-Platform-Settings-V1.3.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revC.xml
http://www.spec.org/cpu2017/flags/CAICT-Platform-Settings-V1.3.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.5 on 2021-04-22 23:43:46-0400.
Report generated on 2021-05-12 13:43:23 by CPU2017 PDF formatter v6442.
Originally published on 2021-05-11.