# SPEC CPU®2017 Integer Rate Result

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## KTNF

(Test Sponsor: Telecommunications Technology Association)

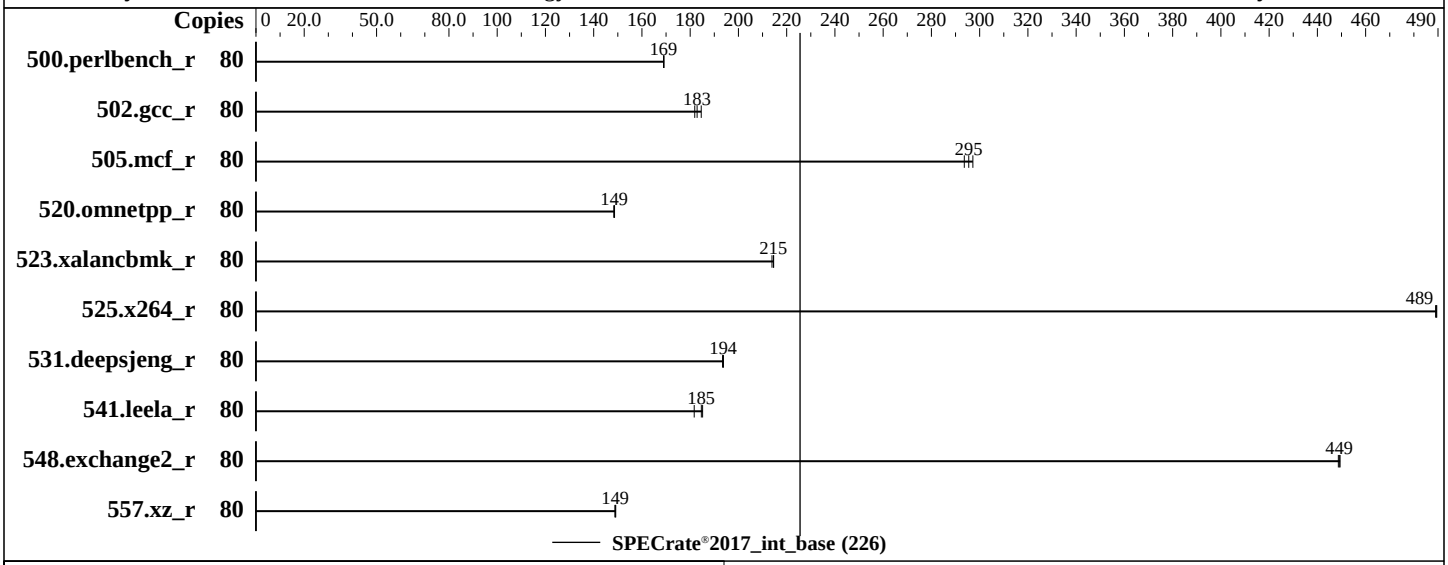
KTNF KR580S1
(2.50 GHz, Intel Xeon Gold 6248)

SPECrate®2017_int_base = 226

SPECrate®2017_int_peak = Not Run

**CPU2017 License:** 83
**Test Sponsor:** Telecommunications Technology Association
**Tested by:** Telecommunications Technology Association

**Test Date:** Oct-2020
**Hardware Availability:** Jul-2019
**Software Availability:** Oct-2020




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Gold 6248 |
| Max MHz: | 3900 |
| Nominal: | 2500 |
| Enabled: | 40 cores, 2 chips, 2 threads/core |
| Orderable: | 2 chip |
| 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: | 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666) |
| Storage: | 1 X 477 GB SATA SSD |
| Other: | None |

## Software

| | |
|---|---|
| OS: | SLES Linux Enterprise Server 15 SP2 5.3.18-24.24-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 KM-H620-212B-KT-P released Nov-2019 |
| File System: | xfs |
| System State: | Run level 3 (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 |

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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 | 80 | **754** | **169** | 753 | 169 | 754 | 169 | | | | | | | |
| 502.gcc_r | 80 | 623 | 182 | **619** | **183** | 614 | 185 | | | | | | | |
| 505.mcf_r | 80 | 435 | 297 | 440 | 294 | **438** | **295** | | | | | | | |
| 520.omnetpp_r | 80 | 708 | 148 | 706 | 149 | **707** | **149** | | | | | | | |
| 523.xalancbmk_r | 80 | **394** | **215** | 394 | 215 | 395 | 214 | | | | | | | |
| 525.x264_r | 80 | 286 | 489 | 286 | 489 | **286** | **489** | | | | | | | |
| 531.deepsjeng_r | 80 | 473 | 194 | **473** | **194** | 474 | 193 | | | | | | | |
| 541.leela_r | 80 | 729 | 182 | **718** | **185** | 716 | 185 | | | | | | | |
| 548.exchange2_r | 80 | **467** | **449** | 466 | 449 | 467 | 449 | | | | | | | |
| 557.xz_r | 80 | 579 | 149 | 581 | 149 | **580** | **149** | | | | | | | |

**SPECrate®2017_int_base = 226**

**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 config file option 'submit' was used.
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
      "/home/spec/cpu2017/ia32:/home/spec/cpu2017/intel64:/home/spec/cpu2017/j
      e5.0.1-32:/home/spec/cpu2017/je5.0.1-64"
```

## General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/spec/cpu2017/ia32
:/home/spec/cpu2017/intel64
:/home/spec/cpu2017/je5.0.1-32
:/home/spec/cpu2017/je5.0.1-64"
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.
Console Redirection -> Disabled
SR-IOV Support -> Disabled
IMC Interleaving -> 1-way Interleave
```

**(Continued on next page)**

## General Notes (Continued)

```
PassThrough DMA -> Enable
Intel VT for Directed I/O(VT-d) -> Enable
ATS -> Enable
Posted Interrupt -> Enable
Coherency Support(Non-Isoch) -> Enable
CPU P State Control -> Energy Efficient Turbo -> Enable
Package C State Control -> Package C State -> C0/C1 State
```

## Platform Notes

```
 Sysinfo program /home/spec/cpu2017/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on speck1 Fri Oct 30 15:52:07 2020

 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
      Address sizes:       46 bits physical, 48 bits virtual
      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:            7
```

**(Continued on next page)**

## Platform Notes (Continued)

```
      CPU MHz:               3260.843
      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):     0-2,5,6,10-12,15,16,40-42,45,46,50-52,55,56
      NUMA node1 CPU(s):     3,4,7-9,13,14,17-19,43,44,47-49,53,54,57-59
      NUMA node2 CPU(s):     20-22,25,26,30-32,35,36,60-62,65,66,70-72,75,76
      NUMA node3 CPU(s):     23,24,27-29,33,34,37-39,63,64,67-69,73,74,77-79
      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 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 cdp_l3
      invpcid_single intel_ppin 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 dtherm ida arat pln pts hwp hwp_act_window hwp_epp
      hwp_pkg_req pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

  /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: 95265 MB
    node 0 free: 86456 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: 96729 MB
    node 1 free: 91860 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: 96763 MB
    node 2 free: 79164 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: 96525 MB
    node 3 free: 83562 MB
    node distances:
    node   0   1   2   3
      0:  10  11  21  21
```

**(Continued on next page)**

## Platform Notes (Continued)

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

  From /proc/meminfo
     MemTotal:       394530548 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  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 speck1 5.3.18-24.24-default #1 SMP Tue Oct 6 06:49:22 UTC 2020 (a291df1) x86_64
     x86_64 x86_64 GNU/Linux

  Kernel self-reported vulnerability status:

  itlb_multihit:                           KVM: Mitigation: VMX disabled
  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
  srbds:                                   Not affected
  tsx_async_abort:                         Mitigation: Clear CPU buffers; SMT vulnerable

  run-level 3 2020-10-29 13:58

  SPEC is set to: /home/spec/cpu2017
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda3      xfs   477G  121G  357G  26% /home

  From /sys/devices/virtual/dmi/id
      BIOS:    American Megatrends Inc. KM-H620-212B-KT-P 11/28/2019
```

**(Continued on next page)**

## Platform Notes (Continued)

```
     Vendor:  KTNF Co.,Ltd
     Product: KM-H620

  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:
      12x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933
      12x NO DIMM NO DIMM

  (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)
------------------------------------------------------------------------------
icc (ICC) 19.0.4.227 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)
------------------------------------------------------------------------------
icpc (ICC) 19.0.4.227 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 19.0.4.227 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

## Base Compiler Invocation

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

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

**(Continued on next page)**

## Base Compiler Invocation (Continued)

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/opt/intel/lib/intel64 -lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -L/opt/intel/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/opt/intel/lib/intel64 -lqkmalloc

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/KTNF-Platform-Flags-Version-KM-H620-10B1-SA2.html
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2020-11-25.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/KTNF-Platform-Flags-Version-KM-H620-10B1-SA2.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2020-11-25.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 v1.1.0 on 2020-10-30 02:52:07-0400.
Report generated on 2020-11-25 10:28:20 by CPU2017 PS formatter v6255.
Originally published on 2020-11-24.