SPEC CPU®2017 Integer Rate Result

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

Huawei 2288H V6 (Intel Xeon Platinum 8380)

$SPECrate^{®}2017\_int\_base =$ **564**

$SPECrate^{®}2017\_int\_peak =$ Not Run
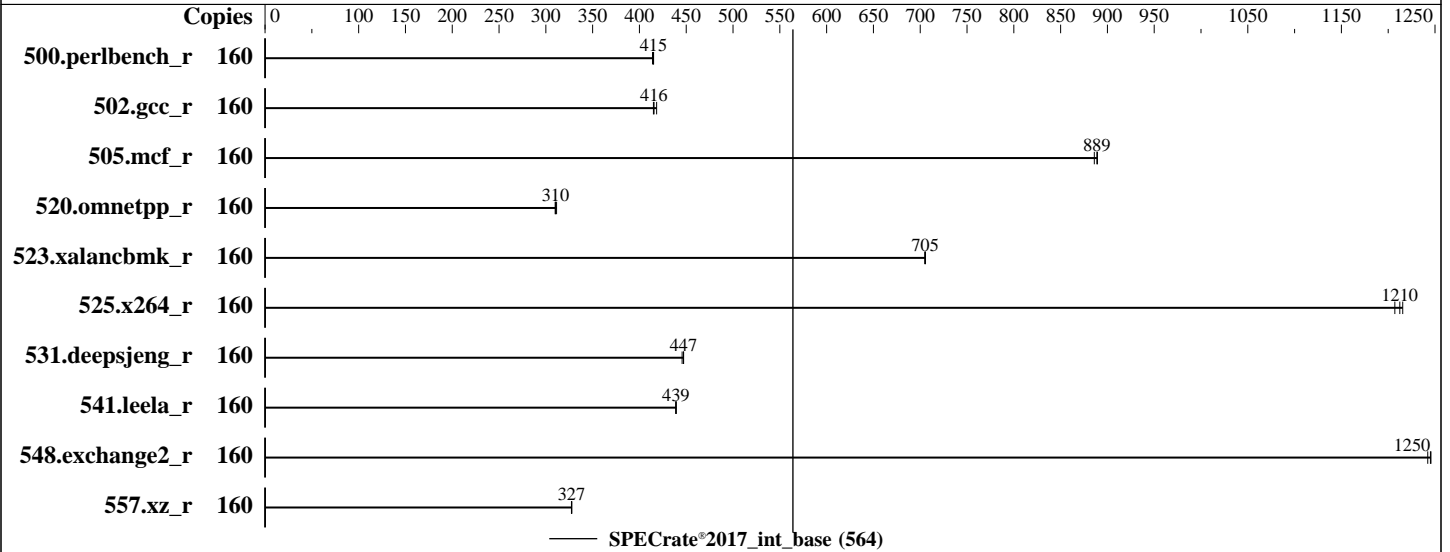
CPU2017 License: 6177
Test Sponsor: China Academy of Information and Communications Technology
Tested by: China Academy of Information and Communications Technology

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

Benchmark	Copies	Result
500.perlbench_r	160	415
502.gcc_r	160	416
505.mcf_r	160	889
520.omnetpp_r	160	310
523.xalancbmk_r	160	705
525.x264_r	160	1210
531.deepsjeng_r	160	447
541.leela_r	160	439
548.exchange2_r	160	1250
557.xz_r	160	327

SPECrate®2017_int_base (564)

Hardware

CPU Name: Intel Xeon Platinum 8380
 Max MHz: 3400
 Nominal: 2300
Enabled: 80 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: 60 MB I+D on chip per chip
 Other: None
Memory: 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 960 GB 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 0.66 released Apr-2021
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.

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

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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	160	**614**	**415**	615	414	614	415							
502.gcc_r	160	542	418	**545**	**416**	546	415							
505.mcf_r	160	291	889	292	886	**291**	**889**							
520.omnetpp_r	160	**676**	**310**	674	311	677	310							
523.xalancbmk_r	160	239	706	240	705	**240**	**705**							
525.x264_r	160	**231**	**1210**	232	1210	230	1220							
531.deepsjeng_r	160	411	446	410	447	**410**	**447**							
541.leela_r	160	603	439	**603**	**439**	604	439							
548.exchange2_r	160	337	1240	337	1250	**337**	**1250**							
557.xz_r	160	528	327	527	328	**528**	**327**							

SPECrate®2017_int_base =   564

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 ondemand

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

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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 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 Sun Apr 25 03:03:28 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 8380 CPU @ 2.30GHz
      2  "physical id"s (chips)
      160 "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 : 40
      siblings  : 80
      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 38 39
      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 38 39

From lscpu:
     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):              160
     On-line CPU(s) list: 0-159
     Thread(s) per core:  2
     Core(s) per socket:  40
```

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Platform Notes (Continued)

```
       Socket(s):           2
       NUMA node(s):         4
       Vendor ID:           GenuineIntel
       CPU family:          6
       Model:               106
       Model name:          Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
       Stepping:            6
       CPU MHz:             918.818
       CPU max MHz:         2301.0000
       CPU min MHz:         800.0000
       BogoMIPS:            4600.00
       Virtualization:      VT-x
       L1d cache:           48K
       L1i cache:           32K
       L2 cache:            1280K
       L3 cache:            61440K
       NUMA node0 CPU(s):   0-19,80-99
       NUMA node1 CPU(s):   20-39,100-119
       NUMA node2 CPU(s):   40-59,120-139
       NUMA node3 CPU(s):   60-79,140-159
       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 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 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 : 61440 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 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87
   88 89 90 91 92 93 94 95 96 97 98 99
   node 0 size: 257392 MB
   node 0 free: 256695 MB
   node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
   103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
   node 1 size: 258004 MB
```

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Platform Notes (Continued)

```
    node 1 free: 257426 MB
    node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
    123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
    node 2 size: 258038 MB
    node 2 free: 257665 MB
    node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
    143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
    node 3 size: 257757 MB
    node 3 free: 257348 MB
    node distances:
    node   0   1   2   3
      0:  10  11  20  20
      1:  11  10  20  20
      2:  20  20  10  11
      3:  20  20  11  10

  From /proc/meminfo
     MemTotal:       1055942032 kB
     HugePages_Total:        0
     Hugepagesize:        2048 kB

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

  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
```

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Platform Notes (Continued)

```
                                                  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 Apr 25 03:02 last=5

 SPEC is set to: /home/spec2017115
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda3       xfs   548G   88G  461G  16% /

 From /sys/devices/virtual/dmi/id
     Vendor:         Huawei
     Product:        2288H V6
     Product Family: Whitley
     Serial:         Huawei

 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:
     32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

 BIOS:
    BIOS Vendor:       INSYDE Corp.
    BIOS Version:      0.66
    BIOS Date:         04/09/2021
    BIOS Revision:     0.66

 (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.
------------------------------------------------------------------------------
```

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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 2021.2.0 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.
------------------------------------------------------------------------------
```

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/2021.2.0/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
-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 2021-04-25 03:03:28-0400.
Report generated on 2021-05-12 13:44:48 by CPU2017 PDF formatter v6442.
Originally published on 2021-05-11.