SPEC® CPU2017 Integer Rate Result

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Huawei
(Test Sponsor: Huawei)

Huawei 5885H V5 (Intel Xeon Gold 6248)

SPECrate2017_int_base = 458

SPECrate2017_int_peak = Not Run

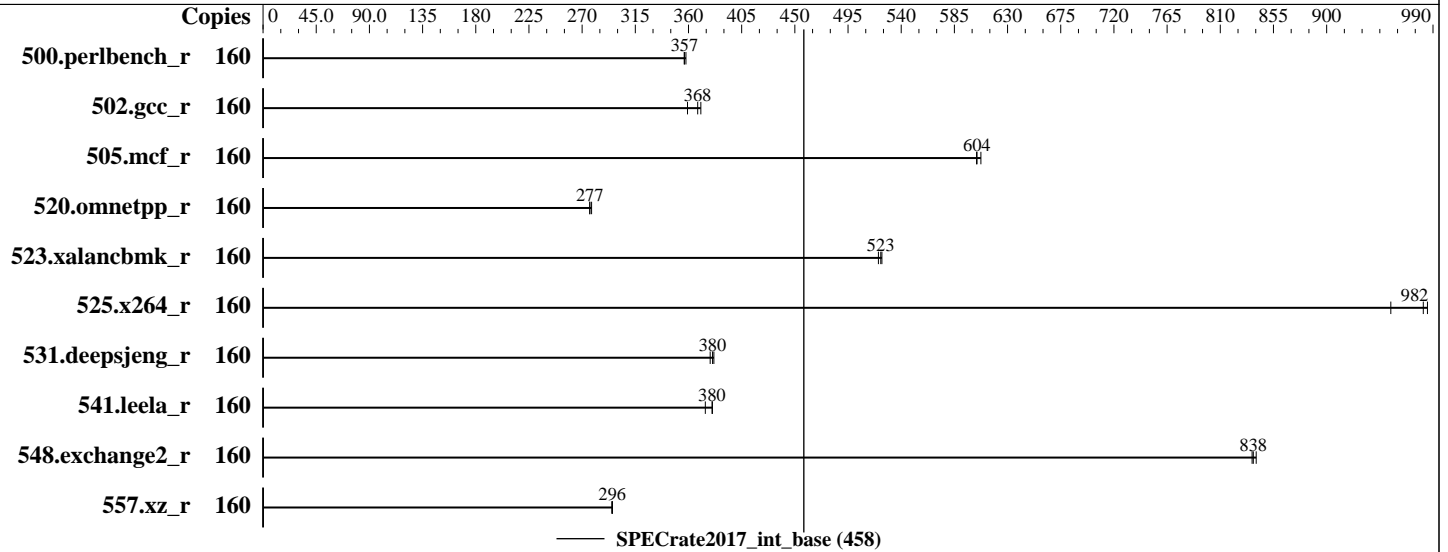**CPU2017 License:** 3175

Test Sponsor: Huawei

Tested by: Huawei

Test Date: Feb-2019

Hardware Availability: Apr-2019

Software Availability: Dec-2018

Copies	Benchmark	Result
160	500.perlbench_r	357
160	502.gcc_r	368
160	505.mcf_r	604
160	520.omnetpp_r	277
160	523.xalancbmk_r	523
160	525.x264_r	982
160	531.deepsjeng_r	380
160	541.leela_r	380
160	548.exchange2_r	838
160	557.xz_r	296

SPECrate2017_int_base (458)

Hardware

CPU Name: Intel Xeon Gold 6248
 Max MHz.: 3900
 Nominal: 2500
Enabled: 80 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: 27.5 MB I+D on chip per chip
 Other: None
Memory: 768 GB (48 x 16 GB 1Rx4 PC4-2933Y-R)
Storage: 1 x 1TB SATA HDD 10K RPM, RAID 0
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP4
 4.12.14-94.41-default
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
 Compiler Build 20181018 for Linux;
 Fortran: Version 19.0.1.144 of Intel Fortran
 Compiler Build 20181018 for Linux
Parallel: No
Firmware: Version 6.20 released Feb-2019
File System: btrfs
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Results Table

| | Base | | | | | | | Peak | | | | | | |
Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	160	712	358	**714**	**357**	715	356							
502.gcc_r	160	**616**	**368**	612	370	631	359							
505.mcf_r	160	426	607	**428**	**604**	428	604							
520.omnetpp_r	160	755	278	759	276	**759**	**277**							
523.xalancbmk_r	160	**323**	**523**	323	524	324	521							
525.x264_r	160	**285**	**982**	284	985	294	954							
531.deepsjeng_r	160	**482**	**380**	481	381	485	378							
541.leela_r	160	708	374	697	380	**697**	**380**							
548.exchange2_r	160	499	840	501	837	**500**	**838**							
557.xz_r	160	585	296	585	295	**585**	**296**							

SPECrate2017_int_base =   **458**

SPECrate2017_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"

General Notes

Environment variables set by runcpu before the start of the run:

LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"

  Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
  memory using Redhat Enterprise Linux 7.5
  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.:
  numactl --interleave=all runcpu <etc>

Yes: 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.

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CPU2017 License: 3175		**Test Date:**	Feb-2019
Test Sponsor: Huawei		**Hardware Availability:**	Apr-2019
Tested by: Huawei		**Software Availability:**	Dec-2018

General Notes (Continued)

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:
Sub NUMA Cluster (SNC) set to enabled
IMC (Integrated memory controller) Interleaving set to 1 way interleave
Xtended Prediction Table (XPT) Prefetch set to Enable
Memory Patrol Scrub set to Disable
Last Level Cache (LLC) Prefetch set to Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-t60c Tue Feb 26 20:02:19 2019

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
      4  "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 : 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
      physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
      physical 3: 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
    CPU(s):                160
    On-line CPU(s) list:   0-159
    Thread(s) per core:    2
    Core(s) per socket:    20
    Socket(s):             4
    NUMA node(s):          8
    Vendor ID:             GenuineIntel
    CPU family:            6
    Model:                 85
    Model name:            Intel(R) Xeon(R) Gold 6248 CPU @ 2.50GHz
```

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Platform Notes (Continued)

```
        Stepping:              6
        CPU MHz:               2500.000
        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):     0-2,5,6,10-12,15,16,80-82,85,86,90-92,95,96
        NUMA node1 CPU(s):     3,4,7-9,13,14,17-19,83,84,87-89,93,94,97-99
        NUMA node2 CPU(s):     20-22,25,26,30-32,35,36,100-102,105,106,110-112,115,116
        NUMA node3 CPU(s):     23,24,27-29,33,34,37-39,103,104,107-109,113,114,117-119
        NUMA node4 CPU(s):     40-42,45,46,50-52,55,56,120-122,125,126,130-132,135,136
        NUMA node5 CPU(s):     43,44,47-49,53,54,57-59,123,124,127-129,133,134,137-139
        NUMA node6 CPU(s):     60-62,65,66,70-72,75,76,140-142,145,146,150-152,155,156
        NUMA node7 CPU(s):     63,64,67-69,73,74,77-79,143,144,147-149,153,154,157-159
        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 cdp_l3 invpcid_single ssbd
    mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid 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 pku ospke
    avx512_vnni 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: 8 nodes (0-7)
    node 0 cpus: 0 1 2 5 6 10 11 12 15 16 80 81 82 85 86 90 91 92 95 96
    node 0 size: 95196 MB
    node 0 free: 93775 MB
    node 1 cpus: 3 4 7 8 9 13 14 17 18 19 83 84 87 88 89 93 94 97 98 99
    node 1 size: 96753 MB
    node 1 free: 95962 MB
    node 2 cpus: 20 21 22 25 26 30 31 32 35 36 100 101 102 105 106 110 111 112 115 116
    node 2 size: 96753 MB
    node 2 free: 96097 MB
    node 3 cpus: 23 24 27 28 29 33 34 37 38 39 103 104 107 108 109 113 114 117 118 119
    node 3 size: 96753 MB
```

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Platform Notes (Continued)

```
   node 3 free: 96148 MB
   node 4 cpus: 40 41 42 45 46 50 51 52 55 56 120 121 122 125 126 130 131 132 135 136
   node 4 size: 96753 MB
   node 4 free: 94351 MB
   node 5 cpus: 43 44 47 48 49 53 54 57 58 59 123 124 127 128 129 133 134 137 138 139
   node 5 size: 96753 MB
   node 5 free: 95517 MB
   node 6 cpus: 60 61 62 65 66 70 71 72 75 76 140 141 142 145 146 150 151 152 155 156
   node 6 size: 96753 MB
   node 6 free: 96124 MB
   node 7 cpus: 63 64 67 68 69 73 74 77 78 79 143 144 147 148 149 153 154 157 158 159
   node 7 size: 96497 MB
   node 7 free: 95869 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  21  21  21  21  21  21
     1:  11  10  21  21  21  21  21  21
     2:  21  21  10  11  21  21  21  21
     3:  21  21  11  10  21  21  21  21
     4:  21  21  21  21  10  11  21  21
     5:  21  21  21  21  11  10  21  21
     6:  21  21  21  21  21  21  10  11
     7:  21  21  21  21  21  21  11  10

 From /proc/meminfo
    MemTotal:       790749652 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP4

 From /etc/*release* /etc/*version*
    SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 4
      # This file is deprecated and will be removed in a future service pack or release.
      # Please check /etc/os-release for details about this release.
    os-release:
      NAME="SLES"
      VERSION="12-SP4"
      VERSION_ID="12.4"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp4"
```

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Platform Notes (Continued)

```
uname -a:
   Linux linux-t60c 4.12.14-94.41-default #1 SMP Wed Oct 31 12:25:04 UTC 2018 (3090901)
   x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Feb 25 10:17

SPEC is set to: /home/cpu2017
   Filesystem      Type   Size  Used Avail Use% Mounted on
   /dev/sda4       btrfs  805G   27G  776G   4% /home

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.
  BIOS INSYDE Corp. 6.20 2019/02/01
  Memory:
   48x Samsung M393A2K40CB2-CVF 16 GB 1 rank 2933

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
  CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
      557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
       541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  FC  548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.1.144 Build 20181018
```

(Continued on next page)

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Compiler Version Notes (Continued)

```
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------
```

Base Compiler Invocation

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

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

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/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc
```

C++ benchmarks:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc
```

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Base Optimization Flags (Continued)

Fortran benchmarks:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.html
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.9.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.xml
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.9.xml

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

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