Huawei

Huawei 5288 V5 (Intel Xeon Silver 4215)

SPECrate2017_int_base = 97.7
SPECrate2017_int_peak = Not Run

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

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<tr>
<th>Copies</th>
<th>SPECrate2017_int_base (97.7)</th>
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<tr>
<td>502.gcc_r</td>
<td>82.9</td>
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<tr>
<td>505.mcf_r</td>
<td>65.6</td>
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<tr>
<td>520.omnetpp_r</td>
<td>117</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>187</td>
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<tr>
<td>525.x264_r</td>
<td>81.3</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>74.0</td>
</tr>
<tr>
<td>541.leela_r</td>
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<tr>
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<td>64.4</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>187</td>
</tr>
</tbody>
</table>

**Hardware**

- CPU Name: Intel Xeon Silver 4215
- Max MHz.: 3500
- Nominal: 2500
- Enabled: 16 cores, 2 chips, 2 threads/core
- Orderable: 1,2 chips
- Cache L1: 32 KB I + 32 KB D on chip per core
- Cache L2: 1 MB I+D on chip per core
- Cache L3: 11 MB I+D on chip per chip
- Other: None
- Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2400)
- Storage: 1 x 1200 GB SAS, 10000 RPM
- Other: None

**Software**

- OS: SUSE Linux Enterprise Server 12 SP4 (x86_64)
- 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 6.52 Released Mar-2019
- File System: xfs
- System State: Run level 3 (multi-user)
- Base Pointers: 64-bit
- Peak Pointers: Not Applicable
- Other: None
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<td>64.4</td>
<td>535</td>
<td>64.6</td>
<td>537</td>
<td>64.4</td>
</tr>
</tbody>
</table>

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:

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.:
umactl --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.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)

(Continued on next page)
# SPEC CPU2017 Integer Rate Result

## Huawei

### Huawei 5288 V5 (Intel Xeon Silver 4215)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
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<tbody>
<tr>
<td>97.7</td>
<td>Not Run</td>
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</table>

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

### General Notes (Continued)

is mitigated in the system as tested and documented.

### Platform Notes

BIOS configuration:  
Power Policy Set to Performance  
SNC Set to Enabled  
IMC Interleaving Set to 1-way Interleave  
XPT Prefetch Set to Enabled  
Sysinfo program /spec2017/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on sles12sp4 Tue Apr 23 16:31:08 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) Silver 4215 CPU @ 2.50GHz
    2 "physical id"s (chips)
    32 "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 : 8
      siblings : 16
      physical 0: cores 0 1 2 3 4 5 6 7
      physical 1: cores 0 1 2 3 4 5 6 7
```

From lscpu:

```
  Architecture:          x86_64
  CPU op-mode(s):        32-bit, 64-bit
  Byte Order:            Little Endian
  CPU(s):                32
  On-line CPU(s) list:   0-31
  Thread(s) per core:    2
  Core(s) per socket:    8
  Socket(s):             2
  NUMA node(s):          2
  Vendor ID:             GenuineIntel
  CPU family:            6
  Model:                 85
  Model name:            Intel(R) Xeon(R) Silver 4215 CPU @ 2.50GHz
  Stepping:              6
  CPU MHz:               2500.000
  CPU max MHz:           3500.0000
  CPU min MHz:           1000.0000
```

(Continued on next page)
Huawei
Huawei 5288 V5 (Intel Xeon Silver 4215) SPEC CPU2017 Integer Rate Result

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CPU2017 License: 3175  
Test Sponsor: Huawei  
Tested by: Huawei

Platform Notes (Continued)

- **BogoMIPS:** 5000.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 11264K

<table>
<thead>
<tr>
<th>NUMA node0 CPU(s)</th>
<th>0-7,16-23</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMA node1 CPU(s)</td>
<td>8-15,24-31</td>
</tr>
</tbody>
</table>

**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 msr tm2 ssse3 sdbg fma cx16 xtrunc pdcm
- pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
- rdrand lahf_lm abm 3nowprefetch cpuid_fault ebpx cat13 cdcp13 invpcid_single ssbd
- mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1
- hlse avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap
- clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaves xsaveopt xsavec xgetbv1 xsaveav
- cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pkup ospke
- avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data
  - cache size : 11264 KB

From numactl --hardware  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 16 17 18 19 20 21 22 23
  - node 0 size: 191904 MB
  - node 0 free: 190069 MB
  - node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
  - node 1 size: 193280 MB
  - node 1 free: 191596 MB
  - node distances:
    - node 0 1
    - 0: 10 21
    - 1: 21 10

From /proc/meminfo
  - MemTotal: 394429268 KB
  - HugePages_Total: 0
  - Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
  - SuSE-release:
    - SUSE Linux Enterprise Server 12 (x86_64)
    - VERSION = 12
    - PATCHLEVEL = 4

(Continued on next page)
Huawei 5288 V5 (Intel Xeon Silver 4215)

CPU2017 License: 3175  Test Date:  Apr-2019
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SPECrate2017_int_base = 97.7  SPECrate2017_int_peak = Not Run

Platform Notes (Continued)

# 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"

uname -a:
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Apr 22 05:51

SPEC is set to: /spec2017
  Filesystem  Type  Size  Used Avail Use% Mounted on
  /dev/sda3  xfs  700G  15G  686G  3% /

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. 6.52 03/16/2019
Memory:
  24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933, configured at 2400

(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

(Continued on next page)
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**Compiler Version Notes (Continued)**

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------------------------------------------------------------------------------
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  
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------------------------------------------------------------------------------

**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
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### 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`

**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:

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

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

Tested with SPEC CPU2017 v1.0.5 on 2019-04-23 16:31:07-0400.  