SPEC® CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Huawei

Huawei CH121 V5 (Intel Xeon Silver 4214)

SPECrate2017_int_base = 132

SPECrate2017_int_peak = Not Run
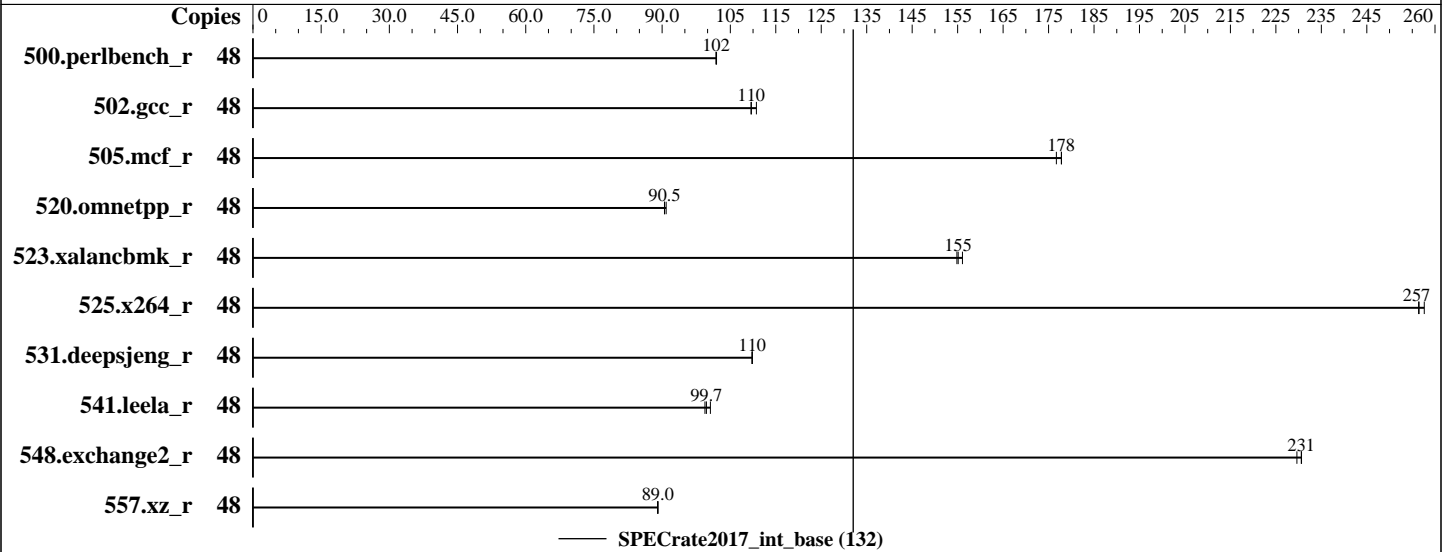
CPU2017 License: 3175

Test Sponsor: Huawei

Tested by: Huawei

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Dec-2018

Copies		Value
500.perlbench_r	48	102
502.gcc_r	48	110
505.mcf_r	48	178
520.omnetpp_r	48	90.5
523.xalancbmk_r	48	155
525.x264_r	48	257
531.deepsjeng_r	48	110
541.leela_r	48	99.7
548.exchange2_r	48	231
557.xz_r	48	89.0

SPECrate2017_int_base (132)

Hardware

CPU Name: Intel Xeon Silver 4214

 Max MHz.: 3200

 Nominal: 2200

Enabled: 24 cores, 2 chips, 2 threads/core

Orderable: 1,2 chips

Cache L1: 32 KB I + 32 KB D on chip per core

 L2: 1 MB I+D on chip per core

 L3: 16.5 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)
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 6.52 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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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	48	750	102	749	102	**750**	**102**							
502.gcc_r	48	**620**	**110**	614	111	620	110							
505.mcf_r	48	**436**	**178**	436	178	439	177							
520.omnetpp_r	48	693	90.9	**696**	**90.5**	696	90.5							
523.xalancbmk_r	48	**327**	**155**	325	156	327	155							
525.x264_r	48	**328**	**257**	328	256	326	258							
531.deepsjeng_r	48	**501**	**110**	501	110	501	110							
541.leela_r	48	800	99.4	**797**	**99.7**	790	101							
548.exchange2_r	48	**545**	**231**	548	230	545	231							
557.xz_r	48	582	89.0	582	89.1	**582**	**89.0**							
SPECrate2017_int_base =		**132**												
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 = "/spec/lib/ia32:/spec/lib/intel64:/spec/je5.0.1-32:/spec/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.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)

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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 /spec/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-7ejo Fri Apr 19 22:57:22 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 4214 CPU @ 2.20GHz
      2  "physical id"s (chips)
      48 "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 : 12
      siblings  : 24
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13

From lscpu:
     Architecture:          x86_64
     CPU op-mode(s):        32-bit, 64-bit
     Byte Order:            Little Endian
     CPU(s):                48
     On-line CPU(s) list:   0-47
     Thread(s) per core:    2
     Core(s) per socket:    12
     Socket(s):             2
     NUMA node(s):          4
     Vendor ID:             GenuineIntel
     CPU family:            6
     Model:                 85
     Model name:            Intel(R) Xeon(R) Silver 4214 CPU @ 2.20GHz
     Stepping:              6
     CPU MHz:               2200.000
     CPU max MHz:           3200.0000
     CPU min MHz:           1000.0000
```

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Platform Notes (Continued)

```
       BogoMIPS:                4400.00
       Virtualization:          VT-x
       L1d cache:               32K
       L1i cache:               32K
       L2 cache:                1024K
       L3 cache:                16896K
       NUMA node0 CPU(s):       0-2,6-8,24-26,30-32
       NUMA node1 CPU(s):       3-5,9-11,27-29,33-35
       NUMA node2 CPU(s):       12-14,18-20,36-38,42-44
       NUMA node3 CPU(s):       15-17,21-23,39-41,45-47
       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 : 16896 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 6 7 8 24 25 26 30 31 32
   node 0 size: 95186 MB
   node 0 free: 78500 MB
   node 1 cpus: 3 4 5 9 10 11 27 28 29 33 34 35
   node 1 size: 96745 MB
   node 1 free: 87756 MB
   node 2 cpus: 12 13 14 18 19 20 36 37 38 42 43 44
   node 2 size: 96716 MB
   node 2 free: 87733 MB
   node 3 cpus: 15 16 17 21 22 23 39 40 41 45 46 47
   node 3 size: 96533 MB
   node 3 free: 87508 MB
   node distances:
   node   0   1   2   3
     0:  10  11  21  21
     1:  11  10  21  21
     2:  21  21  10  11
     3:  21  21  11  10
```

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Platform Notes (Continued)

```
From /proc/meminfo
   MemTotal:       394425752 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
      # 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:
   Linux linux-7ejo 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

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 17 16:39

SPEC is set to: /spec
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda3       xfs   734G  108G  627G  15% /

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)
```

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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
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`

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Base Portability Flags (Continued)

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
```

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-revC.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-revC.xml

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

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