SPEC CPU®2017 Integer Rate Result

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Huawei

(Test Sponsor: Peng Cheng Laboratory)

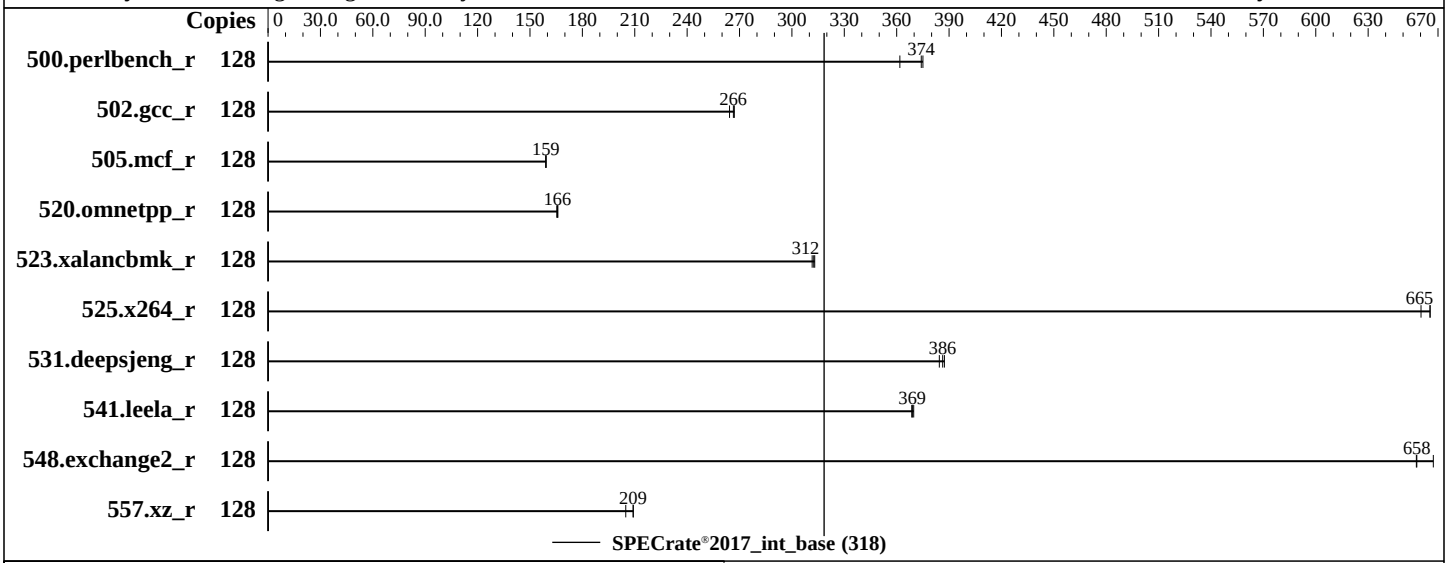
Huawei TaiShan 200 Server (Model 2280)
(2.6 GHz, Huawei Kunpeng 920 7260)

SPECrate®2017_int_base = 318

SPECrate®2017_int_peak = Not Run

CPU2017 License: 5036
Test Sponsor: Peng Cheng Laboratory
Tested by: Peng Cheng Laboratory

Test Date: May-2020
Hardware Availability: Jun-2019
Software Availability: Jul-2020



Hardware

CPU Name:	Huawei Kunpeng 920 7260
Max MHz:	2600
Nominal:	2600
Enabled:	128 cores, 2 chips
Orderable:	1,2 chips
Cache L1:	64 KB I + 64 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	64 MB I+D on chip per chip
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-2933Y-R)
Storage:	1 x 1.92 TB SAS SSD
Other:	None

Software

OS:	kylin release 10 (Azalea) 4.19.90-5.ky10.aarch64
Compiler:	C/C++/Fortran: Version 9.1.0 of GCC, the GNU Compiler Collection
Parallel:	No
Firmware:	Huawei Corp. Version 1.16 released Feb-2020
File System:	xfs
System State:	Run level 5 (multi-user graphical)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	jemalloc memory allocator V5.2.1
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	128	**545**	**374**	543	375	563	362							
502.gcc_r	128	**680**	**266**	679	267	686	264							
505.mcf_r	128	1301	159	**1300**	**159**	1299	159							
520.omnetpp_r	128	1016	165	**1013**	**166**	1012	166							
523.xalancbmk_r	128	434	312	432	313	**433**	**312**							
525.x264_r	128	337	665	**337**	**665**	339	660							
531.deepsjeng_r	128	**380**	**386**	382	384	379	387							
541.leela_r	128	573	370	575	369	**574**	**369**							
548.exchange2_r	128	510	658	**510**	**658**	503	667							
557.xz_r	128	661	209	675	205	**661**	**209**							

SPECrate®2017_int_base = 318

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 taskset mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate taskset 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"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/usr/local/gcc-9.1.0/lib64/:/usr/local/gcc-9.1.0/lib/:/lib64::/home/jem
     alloc-5.2.1-setup/lib"
```

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
jemalloc: configured and built at default for 64bit targets;
jemalloc: built with the kylin V10, and the system compiler gcc 7.3.0;
jemalloc: sources available via jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

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General Notes (Continued)

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.
NA: 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
Custom Refresh Rate Set to 64ms
CPU Prefetcher Set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on localhost.localdomain Fri May 29 09:14:06 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
*
* Did not identify cpu model.  If you would
* like to write your own sysinfo program, see
* www.spec.org/cpu2017/config.html#sysinfo
*
*
* 0 "physical id" tags found.  Perhaps this is an older system,
* or a virtualized system.  Not attempting to guess how to
* count chips/cores for this system.
*
      128 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The following
   excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)

From lscpu:
     Architecture:                    aarch64
     CPU op-mode(s):                  64-bit
     Byte Order:                      Little Endian
     CPU(s):                          128
     On-line CPU(s) list:             0-127
     Thread(s) per core:              1
     Core(s) per socket:              64
     Socket(s):                       2
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node(s):                    4
      Vendor ID:                       HiSilicon
      Model:                           0
      Model name:                      Kunpeng-920
      Stepping:                        0x1
      BogoMIPS:                        200.00
      L1d cache:                       8 MiB
      L1i cache:                       8 MiB
      L2 cache:                        64 MiB
      L3 cache:                        256 MiB
      NUMA node0 CPU(s):               0-31
      NUMA node1 CPU(s):               32-63
      NUMA node2 CPU(s):               64-95
      NUMA node3 CPU(s):               96-127
      Vulnerability Itlb multihit:     Not affected
      Vulnerability L1tf:              Not affected
      Vulnerability Mds:               Not affected
      Vulnerability Meltdown:          Not affected
      Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
      prctl
      Vulnerability Spectre v1:        Mitigation; __user pointer sanitization
      Vulnerability Spectre v2:        Not affected
      Vulnerability Tsx async abort:   Not affected
      Flags:                           fp asimd evtstrm aes pmull sha1 sha2 crc32 atomics
      fphp asimdhp cpuid asimdrdm jscvt fcma dcpop asimddp asimdfhm ssbs

  From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
  physical chip.

  From /proc/meminfo
     MemTotal:       535431808 kB
     HugePages_Total:   100000
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     kylin-release: kylin release 10 (Azalea)
     os-release:
        NAME="kylin"
        VERSION="10 (Azalea)"
        ID="kylin"
        VERSION_ID="10"
        PRETTY_NAME="kylin 10 (Azalea)"
        ANSI_COLOR="0;31"

     system-release: kylin release 10 (Azalea)
     system-release-cpe: cpe:/o:kylin:kylin:10:ga:server
```

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Platform Notes (Continued)

```
 uname -a:
    Linux localhost.localdomain 4.19.90-5.ky10.aarch64 #1 SMP Wed Apr 8 09:34:13 CST 2020
    aarch64 aarch64 aarch64 GNU/Linux

 Kernel self-reported vulnerability status:

 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
 CVE-2017-5753 (Spectre variant 1):        Mitigation: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2):        Not affected
 tsx_async_abort:                          Not affected

 run-level 5 May 29 09:06

 SPEC is set to: /home/cpu2017
    Filesystem              Type  Size  Used Avail Use% Mounted on
    /dev/mapper/klas00-home xfs   1.5T   32G  1.4T   3% /home

 From /sys/devices/virtual/dmi/id
     BIOS:    Huawei Corp. 1.16 02/28/2020
     Vendor:  Huawei
     Product: TaiShan 200 (Model 2280)
     Serial:  2102312PRNN0KC001136

 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:
     16x NO DIMM NO DIMM
     16x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

 (End of data from sysinfo program)
The sysinfo is missing the cpu name, the processor under test is Huawei Kunpeng 920 7260.
The L3 capacity is 64MB per processor for Huawei Kunpeng 920 7260 processor for a SUT
total of 128 MiB.
```

Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
        | 525.x264_r(base) 557.xz_r(base)
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
Using built-in specs.
COLLECT_GCC=/usr/local/gcc-9.1.0/bin/gcc
COLLECT_LTO_WRAPPER=/usr/local/gcc-9.1.0/libexec/gcc/aarch64-unknown-linux-gnu/9.1.0/lto-wrapper
Target: aarch64-unknown-linux-gnu
Configured with: ../configure --enable-checking=release
  --enable-languages=c,c++,fortran --disable-multilib
  --prefix=/usr/local/gcc-9.1.0
Thread model: posix
gcc version 9.1.0 (GCC)
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
        | 541.leela_r(base)
------------------------------------------------------------------------------
Using built-in specs.
COLLECT_GCC=/usr/local/gcc-9.1.0/bin/g++
COLLECT_LTO_WRAPPER=/usr/local/gcc-9.1.0/libexec/gcc/aarch64-unknown-linux-gnu/9.1.0/lto-wrapper
Target: aarch64-unknown-linux-gnu
Configured with: ../configure --enable-checking=release
  --enable-languages=c,c++,fortran --disable-multilib
  --prefix=/usr/local/gcc-9.1.0
Thread model: posix
gcc version 9.1.0 (GCC)
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
Using built-in specs.
COLLECT_GCC=/usr/local/gcc-9.1.0/bin/gfortran
COLLECT_LTO_WRAPPER=/usr/local/gcc-9.1.0/libexec/gcc/aarch64-unknown-linux-gnu/9.1.0/lto-wrapper
Target: aarch64-unknown-linux-gnu
Configured with: ../configure --enable-checking=release
  --enable-languages=c,c++,fortran --disable-multilib
  --prefix=/usr/local/gcc-9.1.0
Thread model: posix
gcc version 9.1.0 (GCC)
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
gcc

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Base Compiler Invocation (Continued)

C++ benchmarks:
g++

Fortran benchmarks:
gfortran

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_AARCH64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
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:
-mabi=lp64 -std=c99 -z muldefs -O3 -march=armv8.2-a+lse -fno-PIE
-no-pie -fomit-frame-pointer -funroll-loops -fno-strict-aliasing
-fgnu89-inline -L/home/jemalloc-5.2.1-setup/lib -ljemalloc

C++ benchmarks:
-mabi=lp64 -std=c++03 -O3 -march=armv8.2-a+lse -fno-PIE -no-pie
-fomit-frame-pointer -funroll-loops -L/home/jemalloc-5.2.1-setup/lib
-ljemalloc

Fortran benchmarks:
-mabi=lp64 -O3 -march=armv8.2-a+lse -fno-PIE -no-pie
-fomit-frame-pointer -funroll-loops -L/home/jemalloc-5.2.1-setup/lib
-ljemalloc

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/gcc.2020-06-30.html
http://www.spec.org/cpu2017/flags/PCL-Platform-Settings-Kunpeng-V1.0-revF.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/gcc.2020-06-30.xml
http://www.spec.org/cpu2017/flags/PCL-Platform-Settings-Kunpeng-V1.0-revF.xml

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

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