Huawei TaiShan 200 Server (Model 2280)

SPECRate®2017_fp_base = 263
SPECRate®2017_fp_peak = Not Run

Test Date: May-2020
Hardware Availability: Jun-2019
Test Sponsor: Peng Cheng Laboratory
Software Availability: Jul-2020

CPU2017 License: 5036
Tested by: Peng Cheng Laboratory

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)
Compiler: C/C++/Fortran: Version 9.1.0 of GCC, the GNU Compiler Collection
Parallel: No
File System: xfs
System State: Run level 5 (multi-user graphical)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Floating Point Rate Result

Huawei
(Test Sponsor: Peng Cheng Laboratory)
Huawei TaiShan 200 Server (Model 2280)
(2.6 GHz,Huawei Kunpeng 920 7260)

SPECrater®2017_fp_base = 263
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>503.bwaves_r</td>
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<td>614</td>
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<td>507.cactuBSSN_r</td>
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<td>508.namd_r</td>
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<td>538.imagick_r</td>
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<td>544.nab_r</td>
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<td>1604</td>
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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:"

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
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

(Continued on next page)
General Notes (Continued)

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 295195f888a3d7ed1e6e46485a0011
running on localhost.localdomain Fri Jun 19 18:35:47 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
NUMA node(s): 4

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Huawei
(Test Sponsor: Peng Cheng Laboratory)
Huawei TaiShan 200 Server (Model 2280)
(2.6 GHz, Huawei Kunpeng 920 7260)

SPECrade®2017_fp_base = 263
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CPU2017 License: 5036
Test Sponsor: Peng Cheng Laboratory
Tested by: Peng Cheng Laboratory

Platform Notes (Continued)

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 asimdffhm 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)

uname -a:

(Continued on next page)
**Platform Notes (Continued)**

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 Jun 19 18:22

SPEC is set to: /home/cpu2017

Filesystem              Type  Size  Used Avail Use% Mounted on
/dev/mapper/klas00-home xfs   1.5T   33G  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 | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
```

Using built-in specs.

(Continued on next page)
Huawei
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CPU2017 License: 5036
Test Sponsor: Peng Cheng Laboratory
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Compiler Version Notes (Continued)

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++             | 508.namd_r(base) 510.parest_r(base)
=================================================================================

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++, C          | 511.povray_r(base) 526.blender_r(base)
=================================================================================

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)
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)
**Huawei**  
(Test Sponsor: Peng Cheng Laboratory)  
Huawei TaiShan 200 Server (Model 2280)  
(2.6 GHz,Huawei Kunpeng 920 7260)

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**Compiler Version Notes (Continued)**

```
C++, C, Fortran | 507.cactuBSSN_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)
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)
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)
==============================================================================
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_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)
==============================================================================
(Continued on next page)
```
**SPEC CPU®2017 Floating Point Rate Result**

**Huawei**

(Test Sponsor: Peng Cheng Laboratory)

**Huawei TaiShan 200 Server (Model 2280)**

(2.6 GHz, Huawei Kunpeng 920 7260)

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**SPECrate®2017_fp_base = 263**

**SPECrate®2017_fp_peak = Not Run**

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<thead>
<tr>
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<th>Notes</th>
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<tbody>
<tr>
<td>Fortran, C</td>
<td>521.wrf_r(base) 527.cam4_r(base)</td>
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<tr>
<td>C benchmarks:</td>
<td>gcc</td>
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<td>C++ benchmarks:</td>
<td>g++</td>
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<td>Fortran benchmarks:</td>
<td>gfortran</td>
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<tr>
<td>Benchmarks using both Fortran and C:</td>
<td>gfortran gcc</td>
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<td>Benchmarks using both C and C++:</td>
<td>g++ gcc</td>
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<tr>
<td>Benchmarks using Fortran, C, and C++:</td>
<td>g++ gcc gfortran</td>
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</table>
SPEC CPU®2017 Floating Point Rate Result

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Hardware Availability: Jun-2019
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Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.prest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -fconvert=big-endian -DSPEC_LP64
526.blender_r: -funsigned-char -DSPEC_LINUX -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-mabi=lp64 -std=c99 -Ofast -g -pipe -flto -march=armv8.2-a+lse -fno-PIE -fomit-frame-pointer -no-pie -funroll-loops

C++ benchmarks:
-mabi=lp64 -Ofast -g -pipe -flto -march=armv8.2-a+lse -fno-PIE -fomit-frame-pointer -no-pie -funroll-loops

Fortran benchmarks:
-mabi=lp64 -Ofast -g -pipe -flto -march=armv8.2-a+lse -fno-PIE -fomit-frame-pointer -no-pie -funroll-loops

Benchmarks using both Fortran and C:
-mabi=lp64 -std=c99 -Ofast -g -pipe -flto -march=armv8.2-a+lse -fno-PIE -fomit-frame-pointer -no-pie -funroll-loops

Benchmarks using both C and C++:
-mabi=lp64 -std=c99 -Ofast -g -pipe -flto -march=armv8.2-a+lse -fno-PIE -fomit-frame-pointer -no-pie -funroll-loops

Benchmarks using Fortran, C, and C++:
-mabi=lp64 -std=c99 -Ofast -g -pipe -flto -march=armv8.2-a+lse -fno-PIE -fomit-frame-pointer -no-pie -funroll-loops

The flags files that were used to format this result can be browsed at
## SPEC CPU®2017 Floating Point Rate Result

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