Huawei

Huawei 5288 V5 (Intel Xeon Gold 5122)

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
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<tr>
<td>CPU2017 License:</td>
<td>3175</td>
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<td>557.xz_r</td>
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</table>

**CPU Name:** Intel Xeon Gold 5122  
**Max MHz.:** 3700  
**Nominal:** 3600  
**Enabled:** 8 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 PC4-2666V-R)  
**Storage:** 1 x 1200 GB SAS, 10000 RPM  
**Other:** None  

**OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)  
**Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
**Compiler for Linux:** Fortran: Version 18.0.0.128 of Intel Fortran  
**Parallel:** No  
**Firmware:** Version 0.62 Released Apr-2018  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 32/64-bit  
**Other:** jemalloc: jemalloc memory allocator library V5.0.1;
Huawei 5288 V5 (Intel Xeon Gold 5122)

SPECrate2017_int_base = 57.0
SPECrate2017_int_peak = 60.2

Results Table

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<td>41.0</td>
<td>421</td>
<td>41.0</td>
<td>421</td>
<td>41.1</td>
<td>16</td>
<td>421</td>
<td>41.0</td>
<td>420</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 i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared:
sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
jemalloc: configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4,
and the system compiler gcc 4.8.5;
jemalloc: sources available from jemalloc.net or

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei
Huawei 5288 V5 (Intel Xeon Gold 5122)

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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Jul-2018
Hardware Availability: Jul-2017
Tested by: Huawei
Software Availability: Jan-2018

General Notes (Continued)

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) 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: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Sun Jul  8 22:35:33 2018

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 5122 CPU @ 3.60GHz
  2 "physical id"s (chips)
  16 "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 : 4
siblings : 8
physical 0: cores 0 5 9 13
physical 1: cores 1 3 4 10

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: LittleEndian
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 4
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85

(Continued on next page)
Huawei

Huawei 5288 V5 (Intel Xeon Gold 5122)

| SPECrate2017_int_base | 57.0 |
| SPECrate2017_int_peak | 60.2 |

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Jul-2018
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Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Gold 5122 CPU @ 3.60GHz
Stepping: 4
CPU MHz: 3600.000
BogoMIPS: 7200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0,2,8,10
NUMA node1 CPU(s): 1,3,9,11
NUMA node2 CPU(s): 4,7,12,15
NUMA node3 CPU(s): 5,6,13,14
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 arch_perfmon pebs bts rep_good ntop nonstop_tsc aperfmpref ru eagerfpu pni pclmulqdq dtstc64 dsc_cpl vmx smx est tm2 ssse3 fma cx16 xtr

/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 2 8 10
    node 0 size: 96437 MB
    node 0 free: 93870 MB
    node 1 cpus: 1 3 9 11
    node 1 size: 98304 MB
    node 1 free: 96044 MB
    node 2 cpus: 4 7 12 15
    node 2 size: 98304 MB
    node 2 free: 95921 MB
    node 3 cpus: 5 6 13 14
    node 3 size: 98304 MB
    node 3 free: 96031 MB
    node distances:
    node 0 1 2 3
    0: 10 11 21 21
    1: 11 10 21 21
    2: 21 21 10 11

(Continued on next page)
Huawei 5288 V5 (Intel Xeon Gold 5122)

SPECrate2017_int_base = 57.0
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Platform Notes (Continued)

3: 21 21 11 10

From /proc/meminfo
MemTotal: 394174812 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID=rhel
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
Linux localhost.localdomain 3.10.0-693.11.6.el7.x86_64 #1 SMP Thu Dec 28 14:23:39 EST 2017 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Jul 8 22:21

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 781G 34G 748G 5% /

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. 0.62 04/03/2018
Memory:
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================

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

---

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
---

C benchmarks
icc

C++ benchmarks
icpc

Fortran benchmarks
ifort

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
# SPEC CPU2017 Integer Rate Result

## Huawei

### Huawei 5288 V5 (Intel Xeon Gold 5122)

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### 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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

**C++ benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

**Fortran benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

### Base Other Flags

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

**C++ benchmarks:**
- `-m64`

**Fortran benchmarks:**
- `-m64`
Huawei

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Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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

Peak Optimization Flags

C benchmarks:
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc


505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc

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## SPEC CPU2017 Integer Rate Result

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**Huawei 5288 V5 (Intel Xeon Gold 5122)**

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### Peak Optimization Flags (Continued)

- 557.xz_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div 
  -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib 
  -ljemalloc

C++ benchmarks:

- 520.omnetpp_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
  -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 
  -L/usr/local/je5.0.1-64/lib -ljemalloc

- 523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 
  -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
  -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 
  -L/usr/local/je5.0.1-32/lib -ljemalloc

- 531.deepsjeng_r: Same as 520.omnetpp_r

- 541.leela_r: Same as 520.omnetpp_r

### Peak Other Flags

**C benchmarks (except as noted below):**

- -m64 -std=c11

- 502.gcc_r: -m32 -std=c11

**C++ benchmarks (except as noted below):**

- -m64

- 523.xalancbmk_r: -m32

**Fortran benchmarks:**

- -m64

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.html

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

- http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml

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Tested with SPEC CPU2017 v1.0.2 on 2018-07-08 22:35:32-0400.
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