**Huawei 5288 V5 (Intel Xeon Gold 6246R)***

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**Hardware**

- **CPU Name:** Intel Xeon Gold 6246R
- **Max MHz:** 4100
- **Nominal:** 3400
- **Enabled:** 32 cores, 2 chips
- **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:** 35.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 960 GB SSD
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)
  - Kernel 4.12.14-94.41-default
- **Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux;
  - Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Version 6.83 released Jun-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** jemalloc memory allocator V5.0.1
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage.
Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 5288 V5 (Intel Xeon Gold 6246R)

SPECspeed®2017_int_base = 11.7
SPECspeed®2017_int_peak = Not Run

CPU2017 License: 6177  Test Date: Jan-2021
Test Sponsor: China Academy of Information and Communications Technology  Hardware Availability: Jul-2020
Tested by: China Academy of Information and Communications Technology  Software Availability: Apr-2020

Results Table

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SPECSpeed®2017_int_base = 11.7
SPECSpeed®2017_int_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/opt/intel/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64:/usr/local/jemalloc64-5.0.1"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

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)
SPEC CPU®2017 Integer Speed Result

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Huawei
(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 5288 V5 (Intel Xeon Gold 6246R)

SPECspeed®2017_int_base = 11.7

SPECspeed®2017_int_peak = Not Run

CPU2017 License: 6177
Test Sponsor: China Academy of Information and Communications Technology
Test Date: Jan-2021
Tested by: China Academy of Information and Communications Technology
Hardware Availability: Jul-2020
Software Availability: Apr-2020

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.
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 Load Balance
Hyper-Threading Set to Disabled
XPT Prefetch Set to Enabled

Sysinfo program /spec2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on linux-j3dr Tue Jan 19 19:29:03 2021

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 6246R CPU @ 3.40GHz
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 : 16
siblings : 16
physical 0: cores 0 2 3 5 6 9 10 12 13 16 18 20 21 24 27 29
physical 1: cores 0 2 3 5 6 9 10 12 13 16 18 20 21 24 27 29

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: 1
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel

(Continued on next page)
## SPEC CPU®2017 Integer Speed Result

**Huawei**  
(Test Sponsor: China Academy of Information and Communications Technology)  
Huawei 5288 V5 (Intel Xeon Gold 6246R)

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**CPU2017 License:** 6177  
**Test Sponsor:** China Academy of Information and Communications Technology  
**Tested by:** China Academy of Information and Communications Technology  
**Test Date:** Jan-2021  
**Hardware Availability:** Jul-2020  
**Software Availability:** Apr-2020

### Platform Notes (Continued)

- **CPU family:** 6  
- **Model:** 85  
- **Model name:** Intel(R) Xeon(R) Gold 6246R CPU @ 3.40GHz  
- **Stepping:** 7  
- **CPU MHz:** 3400.000  
- **CPU max MHz:** 4100.000  
- **CPU min MHz:** 1200.0000  
- **BogoMIPS:** 6800.00  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 36608K  
- **NUMA node0 CPU(s):** 0-15  
- **NUMA node1 CPU(s):** 16-31

**Flags:**  
- fpv mve 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 aperfmprf pni pclmulqdq dtes64 monitor 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 tpr_shadow vnumi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3dnow avx1 f16c rdrand adx smap clflushopt clwb intel_pt avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data  
- cache size: 36608 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 8 9 10 11 12 13 14 15  
- node 0 size: 385551 MB  
- node 0 free: 385008 MB  
- node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
- node 1 size: 387065 MB  
- node 1 free: 386600 MB  
- node distances:  
  - node 0 1  
  - 0: 10 21  
  - 1: 21 10

From /proc/meminfo  
- MemTotal: 791159920 kB  
- HugePages_Total: 0

(Continued on next page)
Platform Notes (Continued)

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:
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
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 Jan 19 19:20

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3  xfs  734G  48G  687G  7% /

From /sys/devices/virtual/dmi/id
  BIOS: INSYDE Corp. 6.83 06/29/2019
  Vendor: Huawei
  Product: 5288 V5
  Product Family: Purley
  Serial: Serial Number

Additional information from dmidecode follows. WARNING: Use caution when you interpret

(Continued on next page)
Huawei

(Test Sponsor: China Academy of Information and Communications Technology)

Huawei 5288 V5 (Intel Xeon Gold 6246R)

CPU2017 License: 6177

Test Sponsor: China Academy of Information and Communications Technology

Tested by: China Academy of Information and Communications Technology

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Test Date: Jan-2021

Platform Notes (Continued)

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:

24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)  
|         | 625.x264_s(base) 657.xz_s(base)       |
==============================================================================

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)  
|         | 641.leela_s(base)       |
==============================================================================

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| Fortran | 648.exchange2_s(base) |
==============================================================================

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

(Continued on next page)
## SPEC CPU®2017 Integer Speed Result

### Huawei

(China Academy of Information and Communications Technology)

#### Huawei 5288 V5 (Intel Xeon Gold 6246R)

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### Base Compiler Invocation (Continued)

```
ifort
```

### Base Portability Flags

```
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```

### Base Optimization Flags

#### C benchmarks:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/ -ljemalloc
```

#### C++ benchmarks:

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/opt/intel/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc
```

#### Fortran benchmarks:

```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries
```
## SPEC CPU®2017 Integer Speed Result

### Huawei
((Test Sponsor: China Academy of Information and Communications Technology)

**Huawei 5288 V5 (Intel Xeon Gold 6246R)**

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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:

- [http://www.spec.org/cpu2017/flags/CAICT-Platform-Settings-V1.3.xml](http://www.spec.org/cpu2017/flags/CAICT-Platform-Settings-V1.3.xml)

---

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

Tested with SPEC CPU®2017 v1.1.0 on 2021-01-19 06:29:03-0500.
Originally published on 2021-03-16.**