### SPEC CPU®2017 Integer Speed Result

**Huawei**

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

**Huawei 2488H V5 (Intel Xeon Gold 6244)**

- **SPECspeed®2017_int_base =** 12.3
- **SPECspeed®2017_int_peak =** Not Run

**CPU2017 License:** 6177
**Test Sponsor:** China Academy of Information and Communications Technology
**Tested by:** China Academy of Information and Communications Technology

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<thead>
<tr>
<th>Test Date:</th>
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<tbody>
<tr>
<td>Nov-2020</td>
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#### Threads

<table>
<thead>
<tr>
<th>SPEC®speed2017_int_base (12.3)</th>
</tr>
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<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>32</td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Gold 6244
- **Max MHz:** 4400
- **Nominal:** 3600
- **Enabled:** 32 cores, 4 chips
- **Orderable:** 2,4 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:** 24.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 736 GB (46 x 16 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 960 GB SATA 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.
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Results Table

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<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
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<tbody>
<tr>
<td></td>
<td>Threads</td>
<td>Seconds</td>
</tr>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>236</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>342</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
<td>224</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>175</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
<td>92.2</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>222</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td>313</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>159</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td>239</td>
</tr>
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</table>

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

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.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)

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

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**Software Availability:** Apr-2020

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**general Notes (continued)**

is mitigated in the system as tested and documented.  
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, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  

---

**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 295195f888a3d7ed6e6a46e46a485a0011  
running on linux-mb4p Sat Nov 7 14:56:29 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

```
model name : Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz
4 "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 : 8
siblings : 8
physical 0: cores 1 2 3 9 18 24 27
physical 1: cores 2 9 17 19 20 25 26 27
physical 2: cores 1 2 4 8 11 18 19 24
physical 3: cores 1 2 3 4 9 11 25 27
```

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: 8
Socket(s): 4
```
## SPEC CPU®2017 Integer Speed Result

### Huawei

(China Academy of Information and Communications Technology)

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**SPECspeed®2017_int_base** = 12.3

**SPECspeed®2017_int_peak** = Not Run

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### Platform Notes (Continued)

```plaintext
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz
Stepping: 7
CPU MHz: 3600.000
CPU max MHz: 4400.0000
CPU min MHz: 1200.0000
BogoMIPS: 7200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
NUMA node2 CPU(s): 16-23
NUMA node3 CPU(s): 24-31
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 pdmep1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dts tsc ept vpid fsgsbase tsc_adjust bni hle avx2 smep bmi2 erms invpcid rtm cqm mxp rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaveprec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pxpke avx512_vnni flush_l1d arch_capabilities
```

From `numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a physical chip.
```
available: 4 nodes (0-3)
nodexx 0 cpus: 0 1 2 3 4 5 6 7
node 0 size: 192728 MB
node 0 free: 192354 MB
node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 161245 MB
node 1 free: 160913 MB
node 2 cpus: 16 17 18 19 20 21 22 23
node 2 size: 193530 MB
node 2 free: 193349 MB
node 3 cpus: 24 25 26 27 28 29 30 31
```

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

- node 3 size: 193311 MB
- node 3 free: 193081 MB
- node distances:
  - node 0 1 2 3
  - 0: 10 21 21 21
  - 1: 21 10 21 21
  - 2: 21 21 10 21
  - 3: 21 21 21 10

From /proc/meminfo
- MemTotal: 758595596 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-mb4p 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-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 Nov 7 14:42

(Continued on next page)
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<th>Platform Notes (Continued)</th>
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</thead>
<tbody>
<tr>
<td>SPEC is set to: /spec2017</td>
</tr>
<tr>
<td>Filesystem     Type  Size  Used Avail Use% Mounted on</td>
</tr>
<tr>
<td>/dev/sda3      xfs   883G   37G  847G  5% /</td>
</tr>
<tr>
<td>From /sys/devices/virtual/dmi/id</td>
</tr>
<tr>
<td>BIOS:    INSYDE Corp. 6.83 06/29/2019</td>
</tr>
<tr>
<td>Vendor:  Huawei</td>
</tr>
<tr>
<td>Product: 2488H V5</td>
</tr>
<tr>
<td>Product Family: Purley</td>
</tr>
<tr>
<td>Serial:  Huawei</td>
</tr>
<tr>
<td>Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is &quot;intended to allow hardware to be accurately determined&quot;, but the intent may not be met, as there are frequent changes to hardware, firmware, and the &quot;DMTF SMI BIOS&quot; standard.</td>
</tr>
<tr>
<td>Memory: 2x NO DIMM NO DIMM</td>
</tr>
<tr>
<td>46x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933</td>
</tr>
<tr>
<td>(End of data from sysinfo program)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compiler Version Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1 NextGen Build 20200304</td>
</tr>
<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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| 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 |

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

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
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

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
- 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

The flags files that were used to format this result can be browsed at:
http://www.spec.org/cpu2017/flags/CAICT-Platform-Settings-V1.3.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revB.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 2020-11-07 01:56:28-0500.