Huawei

Huawei 5288 V5 (Intel Xeon Gold 6244)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base = 11.3</th>
</tr>
</thead>
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CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: Feb-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

---

**Threads**

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base (11.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>0.00 1.00 3.00 5.00 7.00 9.00 11.0 13.0 15.0 17.0 19.0 21.0 23.0 25.0</td>
</tr>
</tbody>
</table>

- 600.perlbench_s 16: 7.72
- 602.gcc_s 16: 11.4
- 605.mcf_s 16: 14.7
- 620.omnetpp_s 16: 8.58
- 623.xalancbmk_s 16: 14.3
- 625.x264_s 16: 15.8
- 631.deepsjeng_s 16: 6.27
- 641.leela_s 16: 5.51
- 648.exchange2_s 16: 16.2
- 657.xz_s 16: 24.0

---

**Hardware**

CPU Name: Intel Xeon Gold 6244
Max MHz.: 4400
Nominal: 3600
Enabled: 16 cores, 2 chips
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: 24.75 MB I+D on chip per chip
Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

---

**Software**

OS: SUSE Linux Enterprise Server 12 SP4 (x86_64) 4.12.14-94.41-default
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux;
Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux
Parallel: Yes
Firmware: Version 6.36 Released Feb-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
SPEC CPU2017 Integer Speed Result

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Huawei

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SPECspeed2017_int_peak = Not Run

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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>16</td>
<td>230</td>
<td>7.72</td>
<td>229</td>
<td>7.76</td>
<td>230</td>
<td>7.72</td>
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<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>350</td>
<td>11.4</td>
<td>349</td>
<td>11.4</td>
<td>350</td>
<td>11.4</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>16</td>
<td>324</td>
<td>14.6</td>
<td>322</td>
<td>14.7</td>
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<td>14.7</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>16</td>
<td>190</td>
<td>8.58</td>
<td>191</td>
<td>8.53</td>
<td>184</td>
<td>8.86</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
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<td>99.7</td>
<td>14.2</td>
<td>99.3</td>
<td>14.3</td>
<td>99.4</td>
<td>14.3</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>16</td>
<td>112</td>
<td>15.8</td>
<td>112</td>
<td>15.8</td>
<td>112</td>
<td>15.8</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>16</td>
<td>229</td>
<td>6.25</td>
<td>228</td>
<td>6.28</td>
<td>228</td>
<td>6.27</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>16</td>
<td>310</td>
<td>5.51</td>
<td>310</td>
<td>5.51</td>
<td>310</td>
<td>5.50</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>16</td>
<td>181</td>
<td>16.2</td>
<td>182</td>
<td>16.2</td>
<td>181</td>
<td>16.2</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>16</td>
<td>257</td>
<td>24.1</td>
<td>257</td>
<td>24.0</td>
<td>257</td>
<td>24.0</td>
</tr>
</tbody>
</table>

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

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:
KMP_AFFINITY = "granularity=fine,compact,1,0"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
## SPEC CPU2017 Integer Speed Result

**Huawei**

Huawei 5288 V5 (Intel Xeon Gold 6244)

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**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Hardware Availability:** Apr-2019  
**Test Date:** Feb-2019  
**Tested by:** Huawei  
**Software Availability:** Dec-2018

### Platform Notes

BIOS configuration:
- Power Policy Set to Load Balance
- Hyper-Threading Set to Disable
- XPT Prefetch Set to Enabled

Sysinfo program /spec2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b091c0f  
running on linux-xz5s Tue Dec 4 01:59:17 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

```plaintext
model name : Intel(R) Xeon(R) Gold 6244 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 : 8
  siblings : 8
  physical 0: cores 2 3 9 11 17 24 27
  physical 1: cores 4 8 17 18 19 24 25 27
```

From lscpu:

```plaintext
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 16  
On-line CPU(s) list: 0-15  
Thread(s) per core: 1  
Core(s) per socket: 8  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz  
Stepping: 6  
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
```

(Continued on next page)
**SPEC CPU2017 Integer Speed Result**

**Huawei**

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**Test Date:** Feb-2019  
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**Platform Notes (Continued)**

NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf 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 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invvpicid_single ssbd mba ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdtsa aavx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xsavec xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occu_p LLC cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

/proccpuinfo cache data
  cache size: 25344 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
  node 0 size: 385471 MB
  node 0 free: 381763 MB
  node 1 cpus: 8 9 10 11 12 13 14 15
  node 1 size: 386787 MB
  node 1 free: 380798 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 790792768 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"

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<table>
<thead>
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<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>PRETTY_NAME=&quot;SUSE Linux Enterprise Server 12 SP4&quot;</td>
</tr>
<tr>
<td>ID=&quot;sles&quot;</td>
</tr>
<tr>
<td>ANSI_COLOR=&quot;0;32&quot;</td>
</tr>
<tr>
<td>CPE_NAME=&quot;cpe:/o:suse:sles:12:sp4&quot;</td>
</tr>
</tbody>
</table>

```
uname -a:
    x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Dec 3 19:29
```

SPEC is set to: /spec2017

Filesystem   Type Size  Used Avail Use% Mounted on
/dev/sda3    xfs  212G   73G  139G  35% /

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. 6.36 02/15/2019
- Memory:
  - 24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

---

### Compiler Version Notes

```
CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
```

```
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

```
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)
```

```
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

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## Compiler Version Notes (Continued)

```
FC 648.exchange2_s(base)
```

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

## Base Compiler Invocation

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

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

- **Fortran benchmarks:**
  - `ifort -m64`

## 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:**
  - `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -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=4`
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**Base Optimization Flags (Continued)**

C++ benchmarks (continued):
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64`
- `-lqkmalloc`

Fortran benchmarks:
- `-xCORE-AVX512`  
  `-ipo`  
  `-O3`  
  `-no-prec-div`  
  `-qopt-mem-layout-trans=4`  
  `-nostandard-realloc-lhs`

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:


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

Tested with SPEC CPU2017 v1.0.2 on 2018-12-04 01:59:17-0500.