## SPEC CPU®2017 Integer Speed Result

### Huawei

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

Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
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<td>Nov-2020</td>
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<td>Mar-2021</td>
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</tr>
<tr>
<td>Tested by:</td>
<td>China Academy of Information and Communications Technology</td>
</tr>
<tr>
<td>Hardware</td>
<td>Software</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>CPU Name: Intel Xeon Platinum 8376HL</td>
<td>OS: SUSE Linux Enterprise Server 15 SP2(x86_64)</td>
</tr>
<tr>
<td>Max MHz: 4300</td>
<td>Kernel 5.3.18-22-default</td>
</tr>
<tr>
<td>Nominal: 2600</td>
<td>Compiler: C/C++: Version 2021.2.0 of Intel oneAPI</td>
</tr>
<tr>
<td>Enabled: 112 cores, 4 chips</td>
<td>DPC++/C++ Compiler Build 20210317 for Linux;</td>
</tr>
<tr>
<td>Orderable: 2.4 chips</td>
<td>Fortran: Version 2021.2.0 of Intel Fortran</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>Compiler Classic Build 20210228 for Linux;</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>C/C++: Version 2021.2.0 of Intel C/C++ Compiler Classic Build 20210228 for Linux;</td>
</tr>
<tr>
<td>L3: 38.5 MB I+D on chip per chip</td>
<td>Parallel: Yes</td>
</tr>
<tr>
<td>Other: None</td>
<td>Firmware: Version 0.67 released Mar-2021</td>
</tr>
<tr>
<td>Memory: 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>Storage: 1 x 3.84 TB SSD</td>
<td>System State: Run level 5 (multi-user)</td>
</tr>
<tr>
<td>Other: None</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage.</td>
<td></td>
</tr>
</tbody>
</table>

| Test Sponsor: China Academy of Information and Communications Technology |
| Tested by: China Academy of Information and Communications Technology |
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### SPECbenchmarks

<table>
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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base (12.3)</th>
</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>112</td>
<td>7.26</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>112</td>
<td>11.2</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>112</td>
<td>20.4</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>112</td>
<td>11.2</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>112</td>
<td>14.7</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>112</td>
<td>18.7</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>112</td>
<td>6.26</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>112</td>
<td>5.25</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>112</td>
<td>18.4</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>112</td>
<td>25.5</td>
</tr>
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Page 1 Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
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Huawei
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Huawei 2488H V6 (Intel Xeon Platinum 8376HL)

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

CPU2017 License: 6177
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Test Date: Apr-2021
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Results Table

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<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
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</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>112</td>
<td>244</td>
<td>7.27</td>
<td>245</td>
<td>7.26</td>
<td>246</td>
<td>7.22</td>
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<tr>
<td>602.gcc_s</td>
<td>112</td>
<td>355</td>
<td>11.2</td>
<td>353</td>
<td>11.3</td>
<td>355</td>
<td>11.2</td>
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<tr>
<td>605.mcfs</td>
<td>112</td>
<td>231</td>
<td>20.4</td>
<td>230</td>
<td>20.5</td>
<td>232</td>
<td>20.3</td>
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<td>144</td>
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<td>146</td>
<td>11.1</td>
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<td>623.xalancbmk_s</td>
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<td>112</td>
<td>325</td>
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<td>160</td>
<td>18.4</td>
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<tr>
<td>657.xz_s</td>
<td>112</td>
<td>239</td>
<td>25.8</td>
<td>240</td>
<td>25.8</td>
<td>239</td>
<td>25.8</td>
</tr>
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SPECspeed®2017_int_base = 12.3
SPECspeed®2017_int_peak = Not Run

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"
SCALING_GOVERNOR set to powersave

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/opt/intel/oneapi/compiler/2021.2.0/linux/compiler/lib/intel64:/usr/local/jemalloc64-5.0.1"
MALLOCS_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) 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

(Continued on next page)
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General Notes (Continued)

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-Threadin Set to Disable
XPT Prefetch Set to Enabled

Sysinfo program /home/spec2017115/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost Sun Apr 25 17:19:42 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) Platinum 8376HL CPU @ 2.60GHz
  4 "physical id"s (chips)
  112 "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 : 28
  siblings : 28

physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30

From lscpu:

  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  Address sizes: 46 bits physical, 48 bits virtual
  CPU(s): 112
  On-line CPU(s) list: 0-111
  Thread(s) per core: 1
  Core(s) per socket: 28
  Socket(s): 4
  NUMA node(s): 4

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### Platform Notes (Continued)

```
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Platinum 8376HL CPU @ 2.60GHz
Stepping:            11
CPU MHz:             1011.004
CPU max MHz:         4300.0000
CPU min MHz:         1000.0000
BogoMIPS:            5200.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            39424K
NUMA node0 CPU(s):   0-27
NUMA node1 CPU(s):   28-55
NUMA node2 CPU(s):   56-83
NUMA node3 CPU(s):   84-111
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 pdpte1gb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref 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 ibrs_enhanced tpr_shadow vnmi flexpriority
epit vpid ept_ad fsgsbase tsc_adjunct bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx
rdt_a avx512f avx512fd 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 avx512_bf16 dtherm ida arat pln pts pku ospke avx512_vnni md_clear
flush_l1d arch_capabilities

/proc/cpuinfo cache data
    cache size : 39424 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 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
node 0 size: 385604 MB
node 0 free: 385036 MB
node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55
node 1 size: 387031 MB
node 1 free: 386149 MB
node 2 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
81 82 83
node 2 size: 387065 MB
```

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Platform Notes (Continued)

node 2 free: 386626 MB
node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111
node 3 size: 386776 MB
node 3 free: 386171 MB
node distances:
node 0 1 2 3
0: 10 20 20 20
1: 20 10 20 20
2: 20 20 10 20
3: 20 20 20 10

From /proc/meminfo
MemTotal: 1583593264 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has powersave

From /etc/*release* /etc/*version*

os-release:
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (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 and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs barriers and __user pointer sanitization

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Platform Notes (Continued)
CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
Not affected
run-level 5 Apr 25 16:05
SPEC is set to: /home/spec2017115
Filesystem     Type Size  Used Avail Use% Mounted on
/dev/sda3      xfs  2.2T   76G  2.1T   4% /home

From /sys/devices/virtual/dmi/id
Vendor: Huawei
Product: 2488H V6
Product Family: Cedar Island
Serial: Huawei
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:
48x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor: ByoSoft
BIOS Version: 0.67
BIOS Date: 03/23/2021

(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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.2.0 Build 20210317
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

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

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**Compiler Version Notes (Continued)**

Intel® oneAPI DPC++/C++ Compiler for applications running on Intel® 64, Version 2021.2.0 Build 20210317
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
Fortran | 648.exchange2_s(base)
------------------------------------------------------------------------------
Intel® Fortran Intel® 64 Compiler Classic for applications running on Intel® 64, Version 2021.2.0 Build 20210228_000000
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

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:
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX2

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## Base Optimization Flags (Continued)

### C benchmarks (continued):

- `-O3 -ffast-math -flto -mfpmath=sse -funroll-loops`  
- `-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`  
- `-L/usr/local/jemalloc64-5.0.1/ -ljemalloc`  

### C++ benchmarks:

- `-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries`  
- `-L/opt/intel/oneapi/compiler/2021.2.0/linux/compiler/lib/intel64_lin`  
- `-lqkmalloc`  

### Fortran benchmarks:

- `-m64 -xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs -align array32byte -auto`  
- `-mbranches-within-32B-boundaries`  

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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