SPEC CPU®2017 Floating Point Speed Result

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

Huawei 1288H V5 (Intel Xeon Gold 6246R)

SPECSpeed®2017_fp_base = 144
SPECSpeed®2017_fp_peak = Not Run

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

| Threads | 0 | 30.0 | 60.0 | 90.0 | 120 | 150 | 180 | 210 | 240 | 270 | 300 | 330 | 360 | 390 | 420 | 450 | 480 | 510 | 540 | 570 | 600 |
|---------|---|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 603.bwaves_s | 32 | 0.0 | 239 | 32 | 196 | 32 | 148 | 32 | 105 | 32 | 61 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 607.cactuBSSN_s | 32 | 0.0 | 166 | 32 | 166 | 32 | 166 | 32 | 166 | 32 | 166 | 32 | 166 | 32 | 166 | 32 | 166 | 32 | 166 | 32 | 166 |
| 619.lbm_s | 32 | 0.0 | 105 | 32 | 105 | 32 | 105 | 32 | 105 | 32 | 105 | 32 | 105 | 32 | 105 | 32 | 105 | 32 | 105 | 32 | 105 |
| 621.wrf_s | 32 | 0.0 | 148 | 32 | 148 | 32 | 148 | 32 | 148 | 32 | 148 | 32 | 148 | 32 | 148 | 32 | 148 | 32 | 148 | 32 | 148 |
| 627.cam4_s | 32 | 0.0 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 | 32 | 96.5 |
| 628.pop2_s | 32 | 0.0 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 | 32 | 71.6 |
| 638.imagick_s | 32 | 0.0 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 | 32 | 94.0 |
| 644.nab_s | 32 | 0.0 | 239 | 32 | 239 | 32 | 239 | 32 | 239 | 32 | 239 | 32 | 239 | 32 | 239 | 32 | 239 | 32 | 239 | 32 | 239 |
| 649.fotonik3d_s | 32 | 0.0 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 | 32 | 91.5 |
| 654.roms_s | 32 | 0.0 | 189 | 32 | 189 | 32 | 189 | 32 | 189 | 32 | 189 | 32 | 189 | 32 | 189 | 32 | 189 | 32 | 189 | 32 | 189 |

Hardware

CPU Name: Intel Xeon Gold 6246R
Max MHz: 4100
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
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
Power Management: BIOS set to prefer performance at the cost of additional power usage.
SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

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Results Table

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<th>Ratio</th>
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<td>644.nab_s</td>
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<td><strong>239</strong></td>
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<td>649.fotonik3d_s</td>
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<td>91.4</td>
<td><strong>99.6</strong></td>
<td><strong>91.5</strong></td>
<td>99.3</td>
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</table>

SPECspeed®2017_fp_base = 144
SPECspeed®2017_fp_peak = Not Run
Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = 
"/opt/intel/compilers_andlibs_2020.1.217/linux/compiler/lib/intel64:
/usr/local/jemalloc64-5.0.1"
MALLOCCONF = "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.
# SPEC CPU®2017 Floating Point Speed Result

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<td><strong>Software Availability</strong>: Apr-2020</td>
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---

## Platform Notes

BIOS configuration:
- Power Policy Set to Load Balance
- Hyper-Threaded Set to Disabled
- XPT Prefetch Set to Enabled

Sysinfo program /spec2017/bin/sysinfo

Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on linux-j3dr Fri Feb 19 12:49:02 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
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:           4100.0000
CPU min MHz:           1200.0000
BogoMIPS:              6800.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
```

(Continued on next page)
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Platform Notes (Continued)

L3 cache: 36608K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
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 pdpe1gb rdtscp
lm constant_tsc art 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
xtrp pdcm pclid 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 stibp tpr_shadow vmmi flexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
dtherm ida arat pin pts pku ospke avx512_vnni flush_l1d arch_capabilities

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: 385580 MB
node 0 free: 384659 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 387036 MB
node 1 free: 386203 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo

MemTotal: 791159920 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"

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

```
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

```
runtime-level 3 Feb 19 10:45
```

```
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: 1288H V5
- Product Family: Purley
- Serial: Serial Number

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:
  - 24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
## Huawei 1288H V5 (Intel Xeon Gold 6246R)

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### Compiler Version Notes

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<th>619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)</th>
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<tbody>
<tr>
<td><strong>Intel(R) C</strong></td>
<td>619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)</td>
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<tr>
<td><strong>Intel(R) 64 Compiler for applications running on Intel(R) 64,</strong></td>
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</tr>
<tr>
<td><strong>Version 19.1.1.217 Build 20200306</strong></td>
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### Base Compiler Invocation

- C benchmarks:  
  - `icc`

(Continued on next page)
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### Base Compiler Invocation (Continued)

Fortran benchmarks:

```plaintext
ifort
```

Benchmarks using both Fortran and C:

```plaintext
ifort icc
```

Benchmarks using Fortran, C, and C++:

```plaintext
icpc icc ifort
```

---

### Base Portability Flags

<table>
<thead>
<tr>
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<td>-DSPEC_LP64</td>
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<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
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<tr>
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<td>-DSPEC_LP64 -DSPEC_CASE_FLAG</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian -assume byterecl</td>
</tr>
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<td>-DSPEC_LP64</td>
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### Base Optimization Flags

**C benchmarks:**

- `-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`
- `-mbranches-within-32B-bounds`  

**Fortran benchmarks:**

- `-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3`
- `-no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs`
- `-mbranches-within-32B-bounds -L/usr/local/jemalloc64-5.0.1 -ljemalloc`

**Benchmarks using both Fortran and C:**

- `-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -mbranches-within-32B-bounds -L/usr/local/jemalloc64-5.0.1 -ljemalloc`

(Continued on next page)
# Huawei

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

## Huawei 1288H 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

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## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

-`-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
-`-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`
-`-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`
-`-L/usr/local/jemalloc64-5.0.1/ -ljemalloc`

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.

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