# SPEC CPU®2017 Integer Speed Result

**New H3C Technologies Co., Ltd.**

H3C UniServer R6700 G3 (Intel Xeon Gold 6246)

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<td>641.leela_s</td>
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<td>657.xz_s</td>
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<td>27.0</td>
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**CPU2017 License:** 9066

**Test Sponsor:** New H3C Technologies Co., Ltd.

**Tested by:** New H3C Technologies Co., Ltd.

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**CPU Name:** Intel Xeon Gold 6246

**Max MHz:** 4200

**Nominal:** 3300

**Enabled:** 48 cores, 4 chips

**Orderable:** 1,2,3,4 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:** 384 GB (24 x 16 GB 2Rx8 PC4-2933V-R)

**Storage:** 1 x 960 GB SATA SSD

**Other:** None

**OS:** Red Hat Enterprise Linux release 8.2 (Ootpa)

**Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler Build 20200306 for Linux;

**Fortran:** Version 19.1.1.217 of Intel Fortran Compiler Build 20200306 for Linux

**Parallel:** Yes

**Firmware:** Version 2.00.33 released Aug-2019 BIOS

**File System:** xfs

**System State:** Run level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** 64-bit

**Other:** jemalloc memory allocator V5.0.1

**Power Management:** BIOS set to prefer performance at the cost of additional power usage
### New H3C Technologies Co., Ltd.

**H3C UniServer R6700 G3 (Intel Xeon Gold 6246)**

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<td>24.9</td>
</tr>
</tbody>
</table>

**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,scatter"
- LD_LIBRARY_PATH = "/home/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

**General Notes**

Binaries compiled on a system with 1x Intel Core i9–7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0

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)
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 Settings:
Set Hyper Threading to Disabled
Set XPT Prefetch to Auto
Set Patrol Scrub to Disabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbi6e46a485a0011
running on localhost.localdomain Wed Sep  9 11:55:21 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 6246 CPU @ 3.30GHz
  4 "physical id"s (chips)
  48 "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 : 12
  siblings : 12
  physical 0: cores 0 1 2 3 4 10 16 17 20 24 26 27
  physical 1: cores 0 1 2 3 4 10 11 17 20 24 25 27
  physical 2: cores 1 2 3 9 10 11 16 17 20 24 26 27
  physical 3: cores 0 2 4 8 9 10 11 17 18 19 25 27

From lscpu:
  Architecture:          x86_64
  CPU op-mode(s):        32-bit, 64-bit
  Byte Order:            Little Endian
  CPU(s):                48
  On-line CPU(s) list:   0-47
  Thread(s) per core:    1
  Core(s) per socket:    12
  Socket(s):             4

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

New H3C Technologies Co., Ltd.

H3C UniServer R6700 G3 (Intel Xeon Gold 6246)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9066</th>
<th>Test Date:</th>
<th>Sep-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>New H3C Technologies Co., Ltd.</td>
<td>Hardware Availability:</td>
<td>Mar-2019</td>
</tr>
<tr>
<td>Tested by:</td>
<td>New H3C Technologies Co., Ltd.</td>
<td>Software Availability:</td>
<td>Apr-2020</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base = 11.5**

**SPECspeed®2017_int_peak = 11.7**

**Platform Notes (Continued)**

NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6246 CPU @ 3.30GHz
Stepping: 7
CPU MHz: 1200.236
CPU max MHz: 4200.000
CPU min MHz: 1200.000
BogoMIPS: 6600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-11
NUMA node1 CPU(s): 12-23
NUMA node2 CPU(s): 24-35
NUMA node3 CPU(s): 36-47
Flags: fpu vme de pse tsc msr pae mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc 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 invpcid_single intel_pme sse2 movbe msraad umip vptpin cmbx aes cmx16 cmx8 cmx16t fma cmx16-a cmx16-t cmx16-e cmx16-f cmx16-r cmx16-k cmx16-0 cmx16-q cmx16-c cmx16-d cmx16-t cmx16-x cmx16-w cmx16-y cmx16-z

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
node 0 size: 95073 MB
node 0 free: 94739 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
node 1 size: 96737 MB
node 1 free: 96164 MB
node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35
node 2 size: 96701 MB
node 2 free: 96404 MB

(Continued on next page)
New H3C Technologies Co., Ltd.

H3C UniServer R6700 G3 (Intel Xeon Gold 6246)

SPECspeed®2017_int_base = 11.5
SPECspeed®2017_int_peak = 11.7

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Sep-2020
Hardware Availability: Mar-2019
Tested by: New H3C Technologies Co., Ltd.
Software Availability: Apr-2020

Platform Notes (Continued)

node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47
node 3 size: 96764 MB
node 3 free: 96764 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: 394523296 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux"
VERSION="8.2 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.2"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

i tlb multihit:
KVM: Mitigation: Split huge pages
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
CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional,
RSB filling
tsx_async_abort:
Mitigation: Clear CPU buffers; SMT disabled

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

New H3C Technologies Co., Ltd.

H3C UniServer R6700 G3 (Intel Xeon Gold 6246)  

**SPECspeed®2017_int_base** = 11.5  
**SPECspeed®2017_int_peak** = 11.7

CPU2017 License: 9066  
Test Sponsor: New H3C Technologies Co., Ltd.  
Test Date: Sep-2020  
Tested by: New H3C Technologies Co., Ltd.  
Hardware Availability: Mar-2019  
Software Availability: Apr-2020

Platform Notes (Continued)

run-level 3 Sep 9 11:49

SPEC is set to: /home/speccpu

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 839G 26G 814G 3% /home

From /sys/devices/virtual/dmi/id

BIOS: American Megatrends Inc. 2.00.33 08/22/2019

Vendor: New H3C Technologies Co., Ltd.

Product: UniServer R6700 G3

Product Family: Rack

Serial: 210200A01SH18B000020

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 Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933
24x NO DIMM NO DIMM

(End of data from sysinfo program)

Compiler Version Notes

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

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

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H3C UniServer R6700 G3 (Intel Xeon Gold 6246)

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**Compiler Version Notes (Continued)**

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 | 600.perlbench_s(peak)
-----------------------------

Intel(R) C 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.

-----------------------------

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

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, peak)
-----------------------------

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

Fortran benchmarks:
ifort
New H3C Technologies Co., Ltd. | SPEC CPU®2017 Integer Speed Result
---|---
H3C UniServer R6700 G3 (Intel Xeon Gold 6246) | SPECspeed®2017_int_base = 11.5
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### Base Portability Flags

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<td>657.xz_s</td>
<td>-DSPEC_LP64</td>
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### Base Optimization Flags

**C benchmarks:**

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -03 -ffast-math -fip0 -mpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

**C++ benchmarks:**

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -03 -ffast-math -fip0 -mpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/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
-03 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries
```

### Peak Compiler Invocation

**C benchmarks:**

```
icc
```

**C++ benchmarks:**

```
icpc
```

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

New H3C Technologies Co., Ltd.  
H3C UniServer R6700 G3 (Intel Xeon Gold 6246)

SPECspeed®2017_int_base = 11.5
SPECspeed®2017_int_peak = 11.7

CPU2017 License: 9066  
Test Date: Sep-2020
Test Sponsor: New H3C Technologies Co., Ltd.  
Tested by: New H3C Technologies Co., Ltd.

Hardware Availability: Mar-2019  
Software Availability: Apr-2020

Peak Compiler Invocation (Continued)

Fortran benchmarks:  
ifort

Peak Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64  
602.gcc_s: -DSPEC_LP64(*) -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

(*) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)  
-xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -fno-strict-overflow  
-mbranches-within-32B-boundaries  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

602.gcc_s: -m64 -qnextgen -std=c11 -fuse-ld=gold  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
-Wl,-z,muldefs -fprofile-generate(pass 1)  
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto  
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -m64 -qnextgen -std=c11  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
-Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math  
-fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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New H3C Technologies Co., Ltd.
H3C UniServer R6700 G3 (Intel Xeon Gold 6246)

SPECspeed®2017_int_base = 11.5
SPECspeed®2017_int_peak = 11.7

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Tested by: New H3C Technologies Co., Ltd.
Test Date: Sep-2020
Hardware Availability: Mar-2019
Software Availability: Apr-2020

Peak Optimization Flags (Continued)

657.xz_s: basepeak = yes
C++ benchmarks:
620.omnetpp_s: basepeak = yes
623.xalancbk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes
Fortran benchmarks:
648.exchange2_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.4-CLX-RevB.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_revA.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.4-CLX-RevB.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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