New H3C Technologies Co., Ltd.

H3C UniServer R5300 G5 (Intel Xeon Platinum 8358)

**SPEC CPU®2017 Integer Speed Result**

**SPECspeed®2017_int_base = 11.7**

**SPECspeed®2017_int_peak = 11.9**

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>SPECspeed®2017_int_base</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<td>8.87</td>
<td>10.7</td>
</tr>
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<td>602.gcc_s</td>
<td>64</td>
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<td>19.7</td>
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<td>64</td>
<td>5.78</td>
<td>17.4</td>
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<td>4.72</td>
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</tr>
<tr>
<td>657.xz_s</td>
<td>64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

CPU Name: Intel Xeon Platinum 8358
Max MHz: 3400
Nominal: 2600
Enabled: 64 cores, 2 chips
Orderable: 1.2 Chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 48 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1.6 TB SSD NVME
Other: None

**Software**

OS: Red Hat Enterprise Linux release 8.3 (Ootpa) 4.18.0-240.el8.x86_64
Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux
Parallel: Yes
Firmware: Version 5.27 released Jun-2021 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: OS set to prefer performance at the cost of additional power usage
## 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

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 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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**Test Date:** Sep-2021  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Tested by:** New H3C Technologies Co., Ltd.  
**Hardware Availability:** Jun-2021  
**Software Availability:** Dec-2020

---

**General Notes (Continued)**


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**Platform Notes**

**BIOS Settings:**
Set Hyper-Threading to disabled  
Set Patrol Scrub to disabled

Sysinfo program /home/speccpu/bin/sysinfo  
Rev: r6622 of 2021-04-07 9b2a61ec0915b55891ef0e16acaf64d  
running on localhost.localdomain Wed Sep 1 18:09:08 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 8358 CPU @ 2.60GHz
  2 "physical id"s (chips)
  64 "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 : 32  
siblings : 32  
physical 0: cores 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 28 29 30 31
physical 1: cores 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 28 29 30 31
```

From lscpu from util-linux 2.32.1:

```
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 64  
On-line CPU(s) list: 0-63  
Thread(s) per core: 1  
Core(s) per socket: 32  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 106  
Model name: Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz  
Stepping: 6  
CPU MHz: 2077.852  
CPU max MHz: 3400.0000
```

(Continued on next page)
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---

**Platform Notes (Continued)**

```plaintext
CPU min MHz: 800.0000  
BogoMIPS: 5200.00  
Virtualization: VT-x  
L1d cache: 48K  
L1i cache: 32K  
L2 cache: 1280K  
L3 cache: 49152K  
NUMA node0 CPU(s): 0-31  
NUMA node1 CPU(s): 32-63  
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpte0 tsc vmx vmxinte pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single intel_ppln ssbd mba ibrs ibpb stibp ibrs enhanced tpr_shadow vnumi flexpriority ept vpid ept_ad fsxbase tsc_adjust bts hle avx2 smep bmi2 4rm invpcid cqm rdt_a avx512f avx512dq rdseed adx smad avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsaveopt xsaves xsaveav xgetbv1 xsaves cqm_llc cqm_occru_llc cqm_mbm_total cqm_mbm local split_lock_detect wbnoinvd dtherm ida arat pln pts hwp hwp act window hwp ehp hwp pkg req avx512vmbi umip pkup ospe avx512_vmbi2 gfin vaes vpclmulqdq avx512_vnvi avx512_vitalg tme avx512_vpopcnt dq la57 rdpid md clear pconfig flush llld arch capabilities

/proc/cpuinfo cache data  
	cache size : 49152 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 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
node 0 size: 244442 MB  
node 0 free: 256280 MB  
node 1 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63  
node 1 size: 244682 MB  
node 1 free: 257167 MB  
node distances:  
		node 0 1  
0:  10  20  
1:  20  10

From /proc/meminfo  
MemTotal: 528006708 KB  
HugePages_Total: 0  
Hugepagesize: 2048 KB
```

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

/sbin/tuned-adm active
   Current active profile: throughput-performance

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

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.3 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.3"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
      ANSI_COLOR="0;31"
      redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
      system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
      system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
   Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
   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/swaps barriers and __user pointer sanitation
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

SPEC is set to: /home/speccpu

Filesystem    Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   1.4T   75G  1.3T   6% /home

(Continued on next page)
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**Software Availability:** Dec-2020

## Platform Notes (Continued)

From /sys/devices/virtual/dmi/id

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor</td>
<td>New H3C Technologies Co., Ltd.</td>
</tr>
<tr>
<td>Product</td>
<td>H3C UniServer R5300 G5</td>
</tr>
<tr>
<td>Product Family</td>
<td>Rack</td>
</tr>
<tr>
<td>Serial</td>
<td>210235A3WGH213000011</td>
</tr>
</tbody>
</table>

Additional information from dmidecode 3.2 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:**
- 16x Hynix HMA84GR7DJR4N-XN 32 GB 2 rank 3200
- 16x NO DIMM NO DIMM

**BIOS:**
- BIOS Vendor: American Megatrends International, LLC.
- BIOS Version: 5.27
- BIOS Date: 06/07/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)

## Compiler Version Notes

```bash
---
C | 600.perlbench_s(peak)
---
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
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)
---
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
---
C | 600.perlbench_s(peak)
---
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
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**Compiler Version Notes (Continued)**

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<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)</th>
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</table>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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<table>
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<tr>
<th>C++</th>
<th>620.omnetpp_s(base, peak) 623.xalanchmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</th>
</tr>
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------------------------------------------------------------------------------
<table>
<thead>
<tr>
<th>Fortran</th>
<th>648.exchange2_s(base, peak)</th>
</tr>
</thead>
</table>
------------------------------------------------------------------------------

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64,  
Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 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

(Continued on next page)
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---

**Base Portability Flags (Continued)**

602.gcc_s: -DSPEC_LP64
605.mcfs: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbk_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-AVX512
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemALLOC

C++ benchmarks:
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
-lqkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries

---

**Peak Compiler Invocation**

C benchmarks (except as noted below):
icx

600.perlbench_s: icc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort
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Peak Portability Flags

Same as Base Portability Flags

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 -std=c11 -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
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs
-xCORE-AVX512 -flto -O3 -ffast-math
-qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s:basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes
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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/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.0-CPX-RevD.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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