New H3C Technologies Co., Ltd.

H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)

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

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Value</th>
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<tr>
<td>600.perlbench_s</td>
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<tr>
<td>602.gcc_s</td>
<td>10.5</td>
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<td>605.mcf_s</td>
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<tr>
<td>620.omnetpp_s</td>
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</tr>
<tr>
<td>623.xalanchmk_s</td>
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<tr>
<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>5.76</td>
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<tr>
<td>641.leela_s</td>
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<tr>
<td>648.exchange2_s</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td></td>
</tr>
</tbody>
</table>

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

Hardware

CPU Name: Intel Xeon Gold 5318N
Max MHz: 3400
Nominal: 2100
Enabled: 48 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: 36 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200V-R, running at 2667)
Storage: 1 x 480GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.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 5.34 released Sep-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: BIOS and OS set to prefer performance at the cost of additional power usage.
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
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<td>22.4</td>
<td>276</td>
<td>22.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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) is mitigated in the system as tested and documented.

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Files system 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
New H3C Technologies Co., Ltd.
H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)

**SPECspeed®2017_int_base = 11.5**

**SPECspeed®2017_int_peak = 11.7**

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<td>New H3C Technologies Co., Ltd.</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Nov-2021</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Sep-2020</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jan-2021</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**


---

**Platform Notes**

BIOS Settings:
Set Hyper-Threading to Disabled
Set Power Performance Tuning to BIOS Controls EPB
Set Energy Performance BIAS to Performance
Set Patrol Scrub to Disabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost.localdomain Wed Nov 17 16:05:49 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 5318N CPU @ 2.10GHz
  2 "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 : 24
siblings : 24
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
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
```

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):              48
On-line CPU(s) list: 0-47
Thread(s) per core:  1
Core(s) per socket:  24
Socket(s):           2
NUMA node(s):        2
Vendor ID:           GenuineIntel
CPU family:          6
Model:               106
Model name:          Intel(R) Xeon(R) Gold 5318N CPU @ 2.10GHz
Stepping:            6
CPU MHz:             1162.199
CPU max MHz:         3400.0000
```

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

H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)

| SPECspeed®2017_int_base = 11.5 |
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CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.
Hardware Availability: Sep-2020
Software Availability: Jan-2021

Test Date: Nov-2021

Platform Notes (Continued)

CPU min MHz: 800.0000
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s): 0-23
NUMA node1 CPU(s): 24-47
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 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 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bm1 hle avx2 smep bmi2 801s invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsaves xsaveopt xsavevc xsave xstate cqm_llc cqm_occup_llc cqm_nbms cqm_mbb_total cqm_mbb_local lwnboinvd dtherm fia ida arat ptn pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vmbi umip pku ospe avx512_vmbi2 gfn s vpcmldqd avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

/cache/cpuinfo cache data
cache size: 36864 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
node 0 size: 515424 MB
node 0 free: 514899 MB
node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 1 size: 516060 MB
node 1 free: 515073 MB
node distances:
node 0 1
0: 10 20
1: 20 10

From /proc/meminfo
MemTotal: 1056240676 KB
HugePages_Total: 0
Hugepagesize: 2048 KB

/sbin/tuned-adm active

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

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Platform Notes (Continued)

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="8.2 (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:

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): No status reported
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Nov 17 16:05

SPEC is set to: /home/speccpu

Filesyste          Type  Size  Used  Avail  Use%  Mounted on
/dev/mapper/rhel-home xfs    392G    31G   361G   8%   /home

From /sys/devices/virtual/dmi/id

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)  

**SPEC CPU®2017 Integer Speed Result**  

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

<table>
<thead>
<tr>
<th>CPU2017 License: 9066</th>
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<td>Software Availability: Jan-2021</td>
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</tbody>
</table>

**Platform Notes (Continued)**

Product Family: Rack

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 HMAA8GR7AJR4N-XN 64 GB 2 rank 3200, configured at 2666
- 16x NO DIMM NO DIMM

BIOS:
- BIOS Vendor: American Megatrends International, LLC.
- BIOS Version: 5.34
- BIOS Date: 09/11/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)

**Compiler Version Notes**

```
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  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

(Continued on next page)
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** SPECspeed®2017_int_base = 11.5 **  
** SPECspeed®2017_int_peak = 11.7 **

---

**Compiler Version Notes (Continued)**

---

**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`

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

New H3C Technologies Co., Ltd.  
H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)

SPECspeed®2017_int_base = 11.5  
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CPU2017 License: 9066  
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Test Sponsor: New H3C Technologies Co., Ltd.  
Hardware Availability: Sep-2020

Tested by: New H3C Technologies Co., Ltd.  
Software Availability: Jan-2021

Base Portability Flags (Continued)

625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leea_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-DSPEC_OPENMP -std=c11 -m64 -fopenmp -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
New H3C Technologies Co., Ltd.

H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)

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Hardware Availability: Sep-2020
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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
New H3C Technologies Co., Ltd.  
H3C UniServer R4300 G5 (Intel Xeon Gold 5318N)

| SPECspeed®2017_int_base = 11.5 |
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Software Availability: Jan-2021

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 CPU®2017 v1.1.8 on 2021-11-17 03:05:49-0500.  
Report generated on 2021-12-07 16:57:06 by CPU2017 PDF formatter v6442.  
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