**SPEC CPU®2017 Integer Rate Result**

New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G3 (Intel Xeon Platinum 8253)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
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</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>187</td>
</tr>
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</table>

**CPU2017 License:** 9066  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Tested by:** New H3C Technologies Co., Ltd.  
**Test Date:** Jul-2021  
**Hardware Availability:** Jun-2019  
**Software Availability:** Dec-2020

<table>
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<td>505.mcf_r</td>
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<td>520.omnetpp_r</td>
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<td>525.x264_r</td>
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<td>548.exchange2_r</td>
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<tr>
<td>557.xz_r</td>
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**Hardware**

**CPU Name:** Intel Xeon Platinum 8253  
**Max MHz:** 3000  
**Nominal:** 2200  
**Enabled:** 32 cores, 2 chips, 2 threads/core  
**Orderable:** 1.2 chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 22 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (12 x 32 GB 2Rx8 PC4-2933Y-R)  
**Storage:** 1 x 240GB SATA SSD  
**Other:** None

**Software**

**OS:** Red Hat Enterprise Linux release 8.2 (Ootpa)  
**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:** No  
**Firmware:** Version 2.00.51 released Jul-2021 BIOS  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 32/64-bit  
**Other:** jemalloc memory allocator V5.0.1  
**Power Management:** BIOS set to prefer performance at the cost of additional power usage
## Results Table

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## 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:

```
LD_LIBRARY_PATH = 
"/home/speccpu/lib/intel64:/home/speccpu/lib/ia32:/home/speccpu/je5.0.1-32"
```

```
MALLOC_CONF = "retain:true"
```

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1

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.

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

New H3C Technologies Co., Ltd.

H3C UniServer R4900 G3 (Intel Xeon Platinum 8253)

SPECrate®2017_int_base = 182
SPECrate®2017_int_peak = 187

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

Test Date: Jul-2021
Hardware Availability: Jun-2019
Software Availability: Dec-2020

General Notes (Continued)

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
Filesystem page cache synced and cleared with:
    sync; echo 3>/proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
    numactl --interleave=all runcpu <etc>
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 SNC to Enabled
Set IMC Interleaving to 1-way Interleave
Set Patrol Scrub to Disabled
Set Adjacent Cache Prefetch to Disabled
Set XPT Prefetcher to Enabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acac6d4
running on localhost.localdomain Sat Jul 17 19:34:54 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 8253 CPU @ 2.20GHz
    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 : 16
    siblings : 32
    physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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

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

- Thread(s) per core: 2
- Core(s) per socket: 16
- Socket(s): 2
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
- Stepping: 6
- CPU MHz: 2500.026
- CPU max MHz: 3000.0000
- CPU min MHz: 1000.0000
- BogoMIPS: 4400.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 22528K
- NUMA node0 CPU(s): 0-3,8-11,32-35,40-43
- NUMA node1 CPU(s): 4-7,12-15,36-39,44-47
- NUMA node2 CPU(s): 16-19,24-27,48-51,56-59
- NUMA node3 CPU(s): 20-23,28-31,52-55,60-63
- 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 pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtses64 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_pcpin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ibrms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsavesopt xsaveopt xsave xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pklu ospke avx512_vnni md_clear flush_l1d arch_capabilities

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 8 9 10 11 32 33 34 35 40 41 42 43
node 0 size: 95080 MB
node 0 free: 94448 MB
node 1 cpus: 4 5 6 7 12 13 14 15 36 37 38 39 44 45 46 47
node 1 size: 96736 MB
node 1 free: 96474 MB

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

- **node 2 cpus**: 16 17 18 19 24 25 26 27 48 49 50 51 56 57 58 59
- **node 2 size**: 96764 MB
- **node 2 free**: 96052 MB
- **node 3 cpus**: 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63
- **node 3 size**: 96763 MB
- **node 3 free**: 95863 MB
- **node distances**: node 0 1 2 3
  - 0: 10 11 21 21
  - 1: 11 10 21 21
  - 2: 21 21 10 11
  - 3: 21 21 11 10

From `/proc/meminfo`
- **MemTotal**: 394593964 kB
- **HugePages_Total**: 0
- **Hugelpagesize**: 2048 kB

/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**="8.2 (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)**: KVM: Mitigation: Split huge pages
**CVE-2018-3620 (L1 Terminal Fault)**: Not affected
**Microarchitectural Data Sampling**: Not affected

(Continued on next page)
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Platform Notes (Continued)

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/swapsgs barriers and __user pointer sanitization
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): Mitigation: Clear CPU buffers; SMT vulnerable

run-level 3 Jul 17 19:33 last=5

SPEC is set to: /home/speccpu
Filesystem            Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home  xfs   168G   77G   92G  46% /home

From /sys/devices/virtual/dmi/id
Vendor:         Unis Huashan Technologies Co., Ltd.
Product:        UniServer R4900 G3
Product Family: Rack
Serial:         210200A00QH177000025

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:
  12x Micron 18ASF4G72PDZ-2G9E1 32 GB 2 rank 2933
  12x NO DIMM NO DIMM

BIOS:
  BIOS Vendor: American Megatrends Inc.
  BIOS Version: 2.00.51
  BIOS Date: 07/06/2021
  BIOS Revision: 5.14

Compiler Version Notes

==============================================================================
C       | 500.perlbench_r(peak) 557.xz_r(peak)
==============================================================================

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**Compiler Version Notes (Continued)**

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       | 502.gcc_r(peak)
==============================================================================

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
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**SPECrates**

- `2017_int_base` = 182
- `2017_int_peak` = 187

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|          |
| Fortran  | 548.exchange2_r(base, peak) |
|          |
| 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. |
|          |

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### Base Compiler Invocation

C benchmarks:

- icx

(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Platinum 8253)

SPECrate®2017_int_base = 182
SPECrate®2017_int_peak = 187

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Jul-2021
Hardware Availability: Jun-2019
Tested by: New H3C Technologies Co., Ltd.
Software Availability: Dec-2020

Base Compiler Invocation (Continued)

C++ benchmarks:
   icpx

Fortran benchmarks:
   ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
   -w -std=c11 -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

C++ benchmarks:
   -w -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:
   -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
   -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
   -auto -mbranches-within-32B-boundaries
   -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin

(Continued on next page)
New H3C Technologies Co., Ltd. | SPEC CPU®2017 Integer Rate Result
H3C UniServer R4900 G3 (Intel Xeon Platinum 8253) | SPECrate®2017_int_base = 182
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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icx
500.perlbench_r: icc
557.xz_r: icc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mc_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:
500.perlbench_r: -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/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin

(Continued on next page)
Peak Optimization Flags (Continued)

500.perlbench_r (continued):
    -lqkmalloc

502.gcc_r: -m32
    -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin
    -std=gnu89 -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/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
    -O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias
    -mbranches-within-32B-boundaries
    -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
    -lqkmalloc

557.xz_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
    -qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
    -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
    -lqkmalloc

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: 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-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.4-CLX-RevB.xml

CPU2017 License: 9066
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New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Platinum 8253)
SPECRate®2017_int_base = 182
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## SPEC CPU®2017 Integer Rate Result

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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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