New H3C Technologies Co., Ltd.

H3C UniServer R4900 G5 (Intel Xeon Gold 6336Y)

SPECCPU®2017 Integer Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 354
SPECrate®2017_int_peak = 366

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

Hardware

CPU Name: Intel Xeon Gold 6336Y
Max MHz: 3600
Nominal: 2400
Enabled: 48 cores, 2 chips, 2 threads/core
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: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
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: No
Firmware: Version 5.39 released Nov-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 and OS set to prefer performance at the cost of additional power usage.

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

500.perlbench_r 96 244
502.gcc_r 96 287 284
505.mcf_r 96 336
520.omnetpp_r 96 217
523.xalancbmk_r 96 450
525.x264_r 96 742 779
531.deepsjeng_r 96 269
541.leela_r 96 264
548.exchange2_r 96 723 773
557.xz_r 96 197 193

SPECrate®2017_int_base (354) SPECrate®2017_int_peak (366)
Results Table

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</table>

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"
MALLOCONF = "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.
SPEC CPU®2017 Integer Rate Result

New H3C Technologies Co., Ltd.
H3C UniServer R4900 G5 (Intel Xeon Gold 6336Y)

SPECratenew_int_base = 354
SPECratenew_int_peak = 366

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

Test Date: Dec-2021
Hardware Availability: Jun-2021
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>

Platform Notes

BIOS Settings:
Set SNC (Sub NUMA) to Enabled
Set Power Performance Tuning to BIOS Controls EPB
Set Energy Performance BIAS to Performance
Set XPT Prefetch to Enabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aaca6d4
running on localhost.localdomain Thu Dec 9 16:15:29 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 6336Y CPU @ 2.40GHz
    2 "physical id"s (chips)
    96 "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 : 48
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): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2

(Continued on next page)
New H3C Technologies Co., Ltd. | SPECrate®2017_int_base = 354
H3C UniServer R4900 G5 (Intel Xeon Gold 6336Y) | SPECrate®2017_int_peak = 366

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<th>Test Date:</th>
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<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

- **Core(s) per socket:** 24
- **Socket(s):** 2
- **NUMA node(s):** 4
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 106
- **Model name:** Intel(R) Xeon(R) Gold 6336Y CPU @ 2.40GHz
- **Stepping:** 6
- **CPU MHz:** 3000.278
- **CPU max MHz:** 3600.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4800.00

**Virtualization:** VT-x

**L1d cache:** 48K
**L1i cache:** 32K
**L2 cache:** 1280K
**L3 cache:** 36864K

**NUMA node0 CPU(s):** 0-11, 48-59
**NUMA node1 CPU(s):** 12-23, 60-71
**NUMA node2 CPU(s):** 24-35, 72-83
**NUMA node3 CPU(s):** 36-47, 84-95

**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 rdtsscp 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 dca sse4_1 mmmoves x2apic movbe popcnt tsc_deadline_timer aes xsave f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_1 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmni flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occucc llc cqm_mbb_total cqm_mbb_local wbinvd dtmu vmm ida arat pln pts hwp hwp_act_window hwp_epp hwp_kpkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfn i vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512 vpoptqopt dq la57 rdpid md_clear pconfig flush_lid

```
/proc/cpuinfo cache data
cache size : 36864 KB
```
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Platform Notes (Continued)

node 1 free: 128730 MB
node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 72 73 74 75 76 77 78 79 80 81 82 83
node 2 size: 128991 MB
node 2 free: 128822 MB
node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 84 85 86 87 88 89 90 91 92 93 94 95
node 3 size: 129016 MB
node 3 free: 128836 MB
node distances:
node 0 1 2 3
0: 10 11 20 20
1: 11 10 20 20
2: 20 20 10 11
3: 20 20 11 10

From /proc/meminfo
MemTotal: 527748380 kB
HugePages_Total: 0
Hugepagesize: 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): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected

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

- Microarchitectural Data Sampling:
  - CVE-2017-5754 (Meltdown): Not affected
  - CVE-2018-3639 (Speculative Store Bypass): Not affected
  - CVE-2017-5753 (Spectre variant 1): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
  - 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 Dec 9 16:07

- SPEC is set to: /home/speccpu
  - Filesystem Type Size Used Avail Use% Mounted on
    - /dev/mapper/rhel-home xfs 392G 119G 273G 31% /home

- From /sys/devices/virtual/dmi/id
  - Vendor: H3C
  - Product: RS33M2C9S
  - 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 Micron 36ASF4G72PZ-3G2E7 32 GB 2 rank 3200
  - 16x NO DIMM NO DIMM

- BIOS:
  - BIOS Vendor: American Megatrends International, LLC.
  - BIOS Version: 5.39
  - BIOS Date: 11/17/2021
  - BIOS Revision: 5.22

(End of data from sysinfo program)

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**Compiler Version Notes**

```
C | 500.perlbench_r(peak) 557.xz_r(peak)
-----------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
```

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Compiler Version Notes (Continued)

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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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
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**Compiler Version Notes (Continued)**

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| C++  | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)  
|------|--------------------------------------------------------|
|      | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)  
|      | --------------------------------------------------------|
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**Base Compiler Invocation**

C benchmarks:  
icxx
SPEC CPU®2017 Integer Rate Result

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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
-lqkmalloc
New H3C Technologies Co., Ltd.  
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**SPECRate®2017_int_base = 354**  
**SPECRate®2017_int_peak = 366**

---

### 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.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

---

### 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 
- -lgkmalloc

- 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

*(Continued on next page)*
SPEC CPU®2017 Integer Rate Result
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New H3C Technologies Co., Ltd.
H3C UniServer R4900 G5 (Intel Xeon Gold 6336Y)

SPECrate®2017_int_base = 354
SPECrate®2017_int_peak = 366

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

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

Peak Optimization Flags (Continued)

502.gcc_r (continued):
-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
-1qkmalloc

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
-1qkmalloc

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

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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