## SPEC CPU®2017 Integer Rate Result

**GIGA-BYTE TECHNOLOGY CO., LTD**  
(Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.)  
R282-3C0

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<tr>
<td>502.gcc_r</td>
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<td>523.xalancbmk_r</td>
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<tr>
<td>531.deepsjeng_r</td>
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<td>541.leela_r</td>
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<tr>
<td>548.exchange2_r</td>
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<td>649</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>96</td>
<td>182</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Gold 5318Y</td>
</tr>
<tr>
<td>Max MHz: 3400</td>
</tr>
<tr>
<td>Nominal: 2100</td>
</tr>
<tr>
<td>Enabled: 48 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>L2: 1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3: 36 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
<tr>
<td>Memory: 512 GB (32 x 16 GB 2Rx8 PC4-3200AA-R, running at 2933)</td>
</tr>
<tr>
<td>Storage: 1 x 1.7 TB SATA, 7200 RPM</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Software</th>
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</thead>
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<tr>
<td>OS: Red Hat Enterprise Linux release 8.3 (Ootpa)</td>
</tr>
<tr>
<td>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</td>
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<tr>
<td>Parallel: No</td>
</tr>
<tr>
<td>Firmware: Version F07 released Apr-2021</td>
</tr>
<tr>
<td>File System: xfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>
SPEC CPU®2017 Integer Rate Result

GIGA-BYTE TECHNOLOGY CO., LTD

R282-3C0

CPU2017 License: 13
Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.
Test Date: Aug-2021
Hardware Availability: May-2021
Tested by: GIGA-BYTE TECHNOLOGY CO., LTD.
Software Availability: Dec-2020

Results Table

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</tr>
</tbody>
</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:

```bash
LD_LIBRARY_PATH = 
"/home/cpu1.1.8-2021.RevB/lib/intel64/:/home/cpu1.1.8-2021.RevB/lib/ia32:
/home/cpu1.1.8-2021.RevB/je5.0.1-32"

MALLOCC_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
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

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

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CPU2017 License: 13  
Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.  
Tested by: GIGA-BYTE TECHNOLOGY CO., LTD.  
Test Date: Aug-2021  
Hardware Availability: May-2021  
Software Availability: Dec-2020

## General Notes (Continued)

runcpu command invoked through numactl i.e.:  
numactl --interleave=all runcpu <etc>

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.


## Platform Notes

BIOS Settings:  
Power Policy set to Best Performance  
DCU Streamer Prefetch set to Disabled  
SNC set to Enabled SNC2(2-Clusters)  
Stale Atos set to Enabled  
LLC Dead Line set to Disabled

Sysinfo program /home/cpu1.1.8-2021.RevB/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acac9ec64d  
running on localhost.localdomain Mon Aug 16 20:42:01 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 5318Y CPU @ 2.10GHz  
- 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  

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

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Test Date: Aug-2021
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Platform Notes (Continued)

Thread(s) per core: 2
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 5318Y CPU @ 2.10GHz
Stepping: 6
CPU MHz: 2600.000
CPU max MHz: 3400.0000
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): 0-11,48-59
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 rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 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 intel_ppin
ssbd mba ibrs ibpb stibp ibrs Enhanced tpr_shadow vmxni flexpriority ept vpid ept ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq
rdseed adv smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw
avx512vl xsaveopt xsaves xsave xsetbv xstores cqm_llc cqm_occup_llc cqm_mmm_total
cqm_mbms_local split_lock_detect wbinvd dtherm ida arat pln pts hwp hwp_act_window
hwp-epp hwp_pkg_req avx512vmbi umip pku ospke avx512_vmbi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_lld
arch_capabilities

/proc/cpuinfo cache data
cache size: 36864 KB

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 12 13 14 15
node 0 size: 125720 MB
node 0 free: 112438 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 125720 MB
node 1 free: 112438 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 2 size: 125720 MB
node 2 free: 112438 MB
node 3 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
node 3 size: 125720 MB
node 3 free: 112438 MB

(Continued on next page)
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**R282-3C0**

**SPECratre®2017_int_base = 320**

**SPECratre®2017_int_peak = 329**

**Platform Notes (Continued)**

```
node 1 size: 127054 MB
node 1 free: 116409 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: 126068 MB
node 2 free: 116464 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: 126029 MB
node 3 free: 115963 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:       527963116 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="8.3 (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
```
GIGA-BYTE TECHNOLOGY CO., LTD  
(Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.)  
R282-3C0  

SPEC CPU®2017 Integer Rate Result  

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SPECrate®2017_int_base = 320  
SPECrate®2017_int_peak = 329  

CPU2017 License: 13  
Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.  
Tested by: GIGA-BYTE TECHNOLOGY CO., LTD.  

Test Date: Aug-2021  
Hardware Availability: May-2021  
Software Availability: Dec-2020  

Platform Notes (Continued)  

CVE-2018-3620 (L1 Terminal Fault): Not affected  
Microarchitectural Data Sampling: Not affected  
CVE-2017-5754 (Meltdown): Mitigation: Speculative Store Bypass disabled via prctl and seccomp  
CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swapgs barriers and __user pointer sanitization  
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling  
CVE-2017-5715 (Spectre variant 2): Not affected  
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected  
CVE-2019-11135 (TSX Asynchronous Abort): Not affected  

run-level 3 Aug 16 03:19  
SPEC is set to: /home/cpu1.1.8-2021.RevB  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/mapper/rhel-home xfs 1.7T 297G 1.4T 18% /home  

From /sys/devices/virtual/dmi/id  
Vendor: GIGABYTE  
Product: R282-3C0-00  
Product Family: Server  
Serial: 01234567890123456789AB  

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:  
32x Hynix HMA82GR7DJR8N-XN 16 GB 2 rank 3200, configured at 2933  

BIOS:  
BIOS Vendor: GIGABYTE  
BIOS Version: F07  
BIOS Date: 04/01/2021  
BIOS Revision: 5.21  

(End of data from sysinfo program)  

Compiler Version Notes  

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

(Continued on next page)
R282-3C0

SPECr®2017_int_base = 320
SPECr®2017_int_peak = 329

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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Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
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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)

(Continued on next page)
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| SPECrate®2017_int_base = 320 |
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| CPU2017 License: | 13 | Test Date: | Aug-2021 |
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**Compiler Version Notes (Continued)**

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<td></td>
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**Base Compiler Invocation**

C benchmarks:

icx

(Continued on next page)
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
-fflto -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

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SPECrate®2017_int_base = 320
SPECrate®2017_int_peak = 329

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Test Date: Aug-2021
Hardware Availability: May-2021
Software Availability: Dec-2020

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-1qkmalloc

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 -03  -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):
-1qkmalloc

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
-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
http://www.spec.org/cpu2017/flags/GIGABYTE-Platform-Flags-Intel-ICX-rev1.2.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/GIGABYTE-Platform-Flags-Intel-ICX-rev1.2.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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