# SPEC CPU®2017 Integer Rate Result

## Quanta Cloud Technology

(Test Sponsor: Quanta Computer Inc.)

## QuantaGrid D53XQ-2U

### CPU2017 License: 9050

**Test Sponsor:** Quanta Computer Inc.  
**Tested by:** Quanta Computer Inc.

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<table>
<thead>
<tr>
<th>Software Availability: Dec-2020</th>
<th>Hardware Availability: Mar-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Date:</td>
<td>Jun-2021</td>
</tr>
</tbody>
</table>

| SPECrate®2017_int_base = 535 | SPECrate®2017_int_peak = Not Run |

**Quanta Cloud Technology**

**QuantaGrid D53XQ-2U**

**Test Sponsor:** Quanta Computer Inc.

**Test Date:** Jun-2021

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**Software Availability:** Dec-2020

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| Copies | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 |
|--------|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 500.perlbench_r | 160 | 379 |
| 502.gcc_r | 160 | 389 |
| 505.mcf_r | 160 | 840 |
| 520.omnetpp_r | 160 | 303 |
| 523.xalancbk_r | 160 | 657 |
| 525.x264_r | 160 | 1140 |
| 531.deepsjeng_r | 160 | 436 |
| 541.leela_r | 160 | 436 |
| 548.exchange2_r | 160 | 1190 |
| 557.xz_r | 160 | 304 |

**SPECrate®2017_int_base (535)**

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### Hardware

**CPU Name:** Intel Xeon Platinum 8380

**Max MHz:** 3400

**Nominal:** 2300

**Enabled:** 80 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:** 60 MB I+D on chip per chip

**Other:** None

**Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)

**Storage:** 1 x 1 TB PCIe 3.0x4 SSD

**Other:** None

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### Software

**OS:** Red Hat Enterprise Linux release 8.2 (Ootpa)  
kernel 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;

**Compiler:**  
C/C++: Version 2021.1 of Intel C/C++ Compiler  
Classic Build 20201112 for Linux

**Parallel:** No

**Firmware:** Version 3A12 released May-2021

**File System:** xfs

**System State:** Run level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** Not Applicable

**Other:** None

**Power Management:** BIOS set to prefer performance at the cost of additional power usage
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Results Table

<table>
<thead>
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<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>577</td>
<td>393</td>
<td>582</td>
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<td>505.mcf_r</td>
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<td>548.exchange2_r</td>
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<td>557.xz_r</td>
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<td>568</td>
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</tr>
</tbody>
</table>

SPECrate®2017_int_base = 535
SPECrate®2017_int_peak = Not Run

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/speccpu2017-newbinary/lib/intel64:/home/speccpu2017-newbinary/lib
    /ia32:/home/speccpu2017-newbinary/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
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)
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 Configuration:
SNC (Sub NUMA) set to Enabled
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Patrol Scrub set to Disabled

Sysinfo program /home/speccpu2017-newbinary/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afea89d4b38e2f1c
running on 192-168-133-90 Tue Jun 8 09:30:19 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 8380 CPU @ 2.30GHz
2 "physical id"s (chips)
160 "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 : 40
siblings : 80
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 32 33 34 35 36 37 38 39
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 32 33 34 35 36 37 38 39

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 160
On-line CPU(s) list: 0-159
Thread(s) per core: 2
Core(s) per socket: 40
Platform Notes (Continued)

| Socket(s):    | 2       |
| NUMA node(s): | 4       |
| Vendor ID:    | GenuineIntel |
| CPU family:   | 6       |
| Model:        | 106     |
| Model name:   | Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz |
| Stepping:     | 6       |
| CPU MHz:      | 3000.000 |
| CPU max MHz:  | 3400.0000 |
| CPU min MHz:  | 800.0000 |
| BogoMIPS:     | 4600.00 |
| Virtualization: | VT-x   |
| L1d cache:    | 48K     |
| L1i cache:    | 32K     |
| L2 cache:     | 1280K   |
| L3 cache:     | 61440K  |
| NUMA node0 CPU(s): | 0-19,80-99 |
| NUMA node1 CPU(s): | 20-39,100-119 |
| NUMA node2 CPU(s): | 40-59,120-139 |
| NUMA node3 CPU(s): | 60-79,140-159 |
| 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 aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrnr 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 vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbbm_total cqm_mbbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkgreq avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig 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 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
node 0 size: 128254 MB
node 0 free: 127507 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119

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

#### Memory:

- **MemTotal:** 527662628 kB
- **HugePages_Total:** 0
- **Hugepagesize:** 2048 kB

#### CPU Affinity:

```
node 1 size: 129015 MB
node 1 free: 120479 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
node 2 size: 129015 MB
node 2 free: 128751 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
node 3 size: 129010 MB
node 3 free: 128734 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
```

#### System Details:

```
From /proc/meminfo
MemTotal:       527662628 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 192-168-133-90 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:
```

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

<table>
<thead>
<tr>
<th>CVE ID</th>
<th>Description</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE-2018-12207</td>
<td>iTLB Multihit</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3620</td>
<td>L1 Terminal Fault</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2017-5754</td>
<td>Meltdown</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3639</td>
<td>Speculative Store Bypass</td>
<td>Mitigation: Speculative Store Bypass disabled via prctl and seccomp</td>
</tr>
<tr>
<td>CVE-2017-5753</td>
<td>Spectre variant 1</td>
<td>Mitigation: usercopy/swaps barriers and __user pointer sanitation</td>
</tr>
<tr>
<td>CVE-2017-5715</td>
<td>Spectre variant 2</td>
<td>Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling</td>
</tr>
<tr>
<td>CVE-2020-0543</td>
<td>Special Register Buffer Data Sampling</td>
<td>No status reported</td>
</tr>
<tr>
<td>CVE-2019-11135</td>
<td>TSX Asynchronous Abort</td>
<td>Not affected</td>
</tr>
</tbody>
</table>

### Filesystem Table

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/nvme0n1p3</td>
<td>xfs</td>
<td>698G</td>
<td>166G</td>
<td>533G</td>
<td>24%</td>
<td>/home</td>
</tr>
</tbody>
</table>

### Additional Information from dmidecode

- Vendor: Quanta Cloud Technology Inc.
- Product: QuantaGrid D53XQ-2U

Additional information from dmidecode 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 NO DIMM NO DIMM
  - 16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200
- BIOS:
  - BIOS Vendor: INSYDE Corp.
  - BIOS Version: 3A12
  - BIOS Date: 05/10/2021
  - BIOS Revision: 5.42
  - Firmware Revision: 3.33

(End of data from sysinfo program)
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Compiler Version Notes
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
  | 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
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++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
  | 541.leela_r(base)
------------------------------------------------------------------------------
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.
==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
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
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64

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Base Portability Flags (Continued)

523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leea_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

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/Quanta-Computer-Inc-Whitley-Platform-Settings-V1.2.xml
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