## Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

<table>
<thead>
<tr>
<th>SPEC®2017_fp_base = 253</th>
<th>SPEC®2017_fp_peak = 260</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 9050</td>
<td>Test Date:</td>
</tr>
<tr>
<td>Test Sponsor: Quanta</td>
<td>Hardware Availability:</td>
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<tr>
<td>Computer Inc.</td>
<td>Mar-2021</td>
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<td>Tested by: Quanta</td>
<td>Software Availability:</td>
</tr>
<tr>
<td>Computer Inc.</td>
<td>Mar-2021</td>
</tr>
</tbody>
</table>

### Hardware
- **CPU Name:** AMD EPYC 7763
- **Max MHz:** 3500
- **Nominal:** 2450
- **Enabled:** 128 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 512 KB I+D on chip per core
- **L3:** 256 MB I+D on chip per chip, 32 MB shared / 8 cores
- **Other:** None
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-L)
- **Storage:** 1 x 480GB SATA M.2 SSD
- **Other:** None

### Software
- **OS:** Ubuntu 20.04.1 LTS
- **Kernel:** 5.4.0-42-generic
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC
- **Parallel:** Yes
- **Firmware:** Version 3C01 released Feb-2021
- **File System:** ext4
- **System State:** Run level 5 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** jemalloc: jemalloc memory allocator library v5.1.0
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>128</td>
<td></td>
<td></td>
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<tr>
<td>627.cam4_s</td>
<td>128</td>
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</tr>
<tr>
<td>628.pop2_s</td>
<td>128</td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>128</td>
<td></td>
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<tr>
<td>644.nab_s</td>
<td>256</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>128</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>128</td>
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### Results Table

<table>
<thead>
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<th>Ratio</th>
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<td>778</td>
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<tr>
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<td>419</td>
<td>39.9</td>
<td>418</td>
<td>40.1</td>
<td>416</td>
<td>128</td>
<td>39.7</td>
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<td>39.9</td>
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<tr>
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<td>394</td>
<td>40.1</td>
<td>393</td>
<td>40.1</td>
<td>393</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_base = 253**

**SPECspeed®2017_fp_peak = 260**

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

### Compiler Notes

The AMD64 AOCC Compiler Suite is available at http://developer.amd.com/amd-aocc/

### Submit Notes

The config file option 'submit' was used. 'numactl' was used to bind copies to the cores.

See the configuration file for details.

### Operating System Notes

'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.
To enable Transparent Hugepages (THP) for all allocations,
SPEC CPU®2017 Floating Point Speed Result

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QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

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SPECspeed®2017_fp_base = 253
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CPU2017 License: 9050
Test Sponsor: Quanta Computer Inc.
Tested by: Quanta Computer Inc.

Test Date: Feb-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-255"
LD_LIBRARY_PATH =
    "/home/cpu2017/amd_speed_aocc300_milan_B_lib/64;/home/cpu2017/amd_speed_aocc300_milan_B_lib/32;"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "256"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 128 1 129 2 130 3 131 4 132 5 133 6 134 7 135 8 136 9
  137 10 138 11 139 12 140 13 141 14 142 15 143 16 144 17 145 18 146 19
  147 20 148 21 149 22 150 23 151 24 152 25 153 26 154 27 155 28 156 29
  157 30 158 31 159 32 160 33 161 34 162 35 163 36 164 37 165 38 166 39
  167 40 168 41 169 42 170 43 171 44 172 45 173 46 174 47 175 48 176 49
  177 50 178 51 179 52 180 53 181 54 182 55 183 56 184 57 185 58 186 59
  187 60 188 61 189 62 190 63 191 64 192 65 193 66 194 67 195 68 196 69
  197 70 198 71 199 72 200 73 201 74 202 75 203 76 204 77 205 78 206 79
  207 80 208 81 209 82 210 83 211 84 212 85 213 86 214 87 215 88 216 89
  217 90 218 91 219 92 220 93 221 94 222 95 223 96 224 97 225 98 226 99
  227 100 228 101 229 102 230 103 231 104 232 105 233 106 234 107 235 108
  236 109 237 110 238 111 239 112 240 113 241 114 242 115 243 116 244 117

(Continued on next page)
Environment Variables Notes (Continued)

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-127"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

Platform Notes

BIOS settings:
Pwr and Perf Profile set to Performance
NUMA nodes per socket is NPS1
Determinism Control is Manual
Determinism Slider set to Power
cTDP Control is Manual
cTDP set to 280
Package Power Limit Control is Manual
Package Power Limit set to 280
IOMMU is Enable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on 192-168-133-37 Fri Feb 26 09:48:24 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 : AMD EPYC 7763 64-Core Processor
Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

SPECspeed®2017_fp_base = 253
SPECspeed®2017_fp_peak = 260

Platform Notes (Continued)

2 "physical id"s (chips)
256 "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 : 64
siblings : 128
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 40 41 42 43 44 45 46 47 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63
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 40 41 42 43 44 45 46 47 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 256
On-line CPU(s) list: 0-255
Thread(s) per core: 2
Core(s) per socket: 64
Socket(s): 2
NUMA node(s): 2
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7763 64-Core Processor
Stepping: 1
Frequency boost: enabled
CPU MHz: 1793.820
CPU max MHz: 2450.0000
CPU min MHz: 1500.0000
BogoMIPS: 4890.90
Virtualization: AMD-V
L1d cache: 4 MiB
L1i cache: 4 MiB
L2 cache: 64 MiB
L3 cache: 512 MiB
NUMA node0 CPU(s): 0-63,128-191
NUMA node1 CPU(s): 64-127,192-255
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp

(Continued on next page)
Platform Notes (Continued)

Vulnerability Spectre v1: Mitigation; usercopyswapgs barriers and __user pointer sanitation

Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBFB conditional, IBRS_FW, STIBP always-on, RSB filling

Vulnerability Srbds: Not affected

Vulnerability Txs async abort: Not affected

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdelgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmpref perf pni pclmulqdq monitor sse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osuw ibs kinit wdt tce toptext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmcall fsqspbase bml avx2 smep bmi2 erms invpcid cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsave xgetbv1 xsavec cqmm llc cqmm_occup llc cgmb_total cgmb_local clzero irperf xsaveprot wbnoinvd arat npt lbrv svm_lock rrip tsc scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgfl umip pk uope vaes vpclmulqdq rdpid overflow_recover succor smca

/proc/cpuinfo cache data

```
cache size: 512 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 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191
node 0 size: 515906 MB
node 0 free: 513885 MB
node 1 cpus: 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191
node 0 size: 513885 MB
node 0 free: 513885 MB
node 1 distances:
node 1: 516062 MB
node distances:
node 0 1
0: 10 32
1: 32 10

From /proc/meminfo
Quanta Cloud Technology
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QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

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SPECspeed®2017_fp_peak = 260

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Software Availability: Mar-2021

Platform Notes (Continued)

MemTotal: 1056735752 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

/usr/bin/lsb_release -d
Ubuntu 20.04.1 LTS

From /etc/*release* /etc/*version*
debian_version: bullseye/sid
os-release:
NAME="Ubuntu"
VERSION="20.04.1 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.1 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"

uname -a:
Linux 192-168-133-37 5.4.0-42-generic #46-Ubuntu SMP Fri Jul 10 00:24:02 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): 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: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 Feb 26 09:47
SPEC is set to: /home/cpu2017

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

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SPECspeed®2017_fp_base = 253
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CPU2017 License: 9050
Test Sponsor: Quanta Computer Inc.
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Platform Notes (Continued)

<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/sda2</td>
<td>ext4</td>
<td>407G</td>
<td>13G</td>
<td>374G</td>
<td>4%</td>
<td>/</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id
Vendor: Quanta Cloud Technology Inc.
Product: QuantaGrid D43K-1U

BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 3C01
BIOS Date: 02/24/2021

(End of data from sysinfo program)

Compiler Version Notes

C
619.lbm_s(base, peak) 638.imagick_s(base, peak)
644.nab_s(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

C++, C, Fortran
607.cactuBSSN_s(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
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SPECspeed®2017_fp_base = 253
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Compiler Version Notes (Continued)

==============================================================================
Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                | 654.roms_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                | 628.pop2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
==============================================================================

Base Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang
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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

SPECspeed®2017_fp_base = 253
SPECspeed®2017_fp_peak = 260

CPU2017 License: 9050
Test Sponsor: Quanta Computer Inc.
Tested by: Quanta Computer Inc.

Test Date: Feb-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021

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Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapioc -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapioc -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

---

Base Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flt -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -ldl -ljemalloc -lflang -lflangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Hz,1,0x1 -O3
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsrc-in-nested-loop
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -ldl -ljemalloc -lflang -lflangrti

Benchmarks using both Fortran and C:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

(Continued on next page)
Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

**SPECspeed®2017_fp_base = 253**

**SPECspeed®2017_fp_peak = 260**

CPU2017 License: 9050
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### Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
- `-W1,-mlvm -W1,-reduce-array-computations=3 -O3 -march=znver3`
- `-fvecclib=AMDLIBM -ffast-math -flto -fstruct-layout=5`
- `-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000`
- `-fremap-arrays -mlvm -function-specialize -flv-function-specialization`
- `-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true`
- `-mlvm -extra-vectorizer-passes -mlvm -lsr-in-nested-loop -z muldefs`
- `-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc`
- `lflang -lflangrti`

Benchmarks using Fortran, C, and C++:
- `-m64 -mno-adx -mno-sse4a -std=c++98`
- `-W1,-mlvm -W1,-x86-use-vzeroupper=false`
- `-W1,-mlvm -W1,-region-vectorize -W1,-mlvm -W1,-function-specialize`
- `-W1,-mlvm -W1,-align-all-nofallthru-blocks=6`
- `-W1,-mlvm -W1,-reduce-array-computations=3 -O3 -march=znver3`
- `-fvecclib=AMDLIBM -ffast-math -flto -fstruct-layout=5`
- `-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000`
- `-fremap-arrays -mlvm -function-specialize -flv-function-specialization`
- `-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true`
- `-mlvm -extra-vectorizer-passes -mlvm -convert-pow-exp-to-int=false`
- `-Hz,1,0x1 -Mrecursive -mlvm -fuse-tile-inner-loop -funroll-loops`
- `-mlvm -extra-vectorizer-passes -mlvm -lsr-in-nested-loop -z muldefs`
- `-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc`
- `lflang -lflangrti`

### Base Other Flags

C benchmarks:
- `-Wno-unused-command-line-argument -Wno-return-type`

Fortran benchmarks:
- `-Wno-unused-command-line-argument -Wno-return-type`

Benchmarks using both Fortran and C:
- `-Wno-unused-command-line-argument -Wno-return-type`

Benchmarks using Fortran, C, and C++:
- `-Wno-unused-command-line-argument -Wno-return-type`
Quanta Cloud Technology
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QuantaGrid D43K-1U
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SPECspeed®2017_fp_base = 253
SPECspeed®2017_fp_peak = 260

Quanta Cloud Technology

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

644.nab_s (continued):
-mlir -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

603.bwaves_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlir -Wl,-enable-X86-prefetching
-Wl,-mlir -Wl,-enable-licm-vrp
-Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlir -reduce-array-computations=3
-mlir -g-vectorize-slp=true -mlir -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlir -Wl,-enable-X86-prefetching
-Wl,-mlir -Wl,-enable-licm-vrp
-Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flito
-fstruct-layout=5 -mlir -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mlir -inline-threshold=1000 -mlir -enable-gvn-hoist
-mlir -global-vectorize-slp=true
-mlir -function-specialize -mlir -enable-licm-vrp
-mlir -reduce-array-computations=3 -Mrecursive
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

628.pop2_s: Same as 627.cam4_s

Benchmarks using Fortran, C, and C++:
Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D43K-1U
(AMD EPYC 7763, 2.45 GHz)

SPECspeed®2017_fp_base = 253
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Peak Optimization Flags (Continued)

607.cactuBSSN_s: basepeak = yes

Peak Other Flags

C benchmarks:
- W-no-unused-command-line-argument -Wno-return-type

Fortran benchmarks:
- W-no-unused-command-line-argument -Wno-return-type

Benchmarks using both Fortran and C:
- W-no-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
- W-no-unused-command-line-argument -Wno-return-type

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/Quanta-Computer-Inc-amd-speccpu-setting-v3_AMD_MILAN.xml

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