### SPEC CPU®2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Quanta Cloud Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>QuantaGrid D44N-1U (2.40 GHz, AMD EPYC 9654)</td>
</tr>
<tr>
<td>Software</td>
<td>Ubuntu 22.04.2 LTS</td>
</tr>
<tr>
<td>CPU2017 License:</td>
<td>9050</td>
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<tr>
<td>Test Sponsor:</td>
<td>Quanta Computer Inc.</td>
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<tr>
<td>Tested by:</td>
<td>Quanta Computer Inc.</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Oct-2023</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Nov-2023</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Sep-2023</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 1640**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_base (1640)</th>
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</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>384</td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>384</td>
<td>1150</td>
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<tr>
<td>505.mcf_r</td>
<td>384</td>
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<td>520.omnetpp_r</td>
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<tr>
<td>523.xalancbmk_r</td>
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<td>1660</td>
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<tr>
<td>525.x264_r</td>
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<td>4120</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>384</td>
<td>1490</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>384</td>
<td>1490</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>384</td>
<td>4080</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>384</td>
<td>866</td>
</tr>
</tbody>
</table>

**Software**

- **OS:** Ubuntu 22.04.2 LTS
- **Compiler:** C/C++/Fortran: Version 4.0.0 of AOCC
- **Parallel:** No
- **Firmware:** Version 3A02 released Sep-2023
- **File System:** ext4
- **System State:** Run level 5 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

**Hardware**

- **Cpu Name:** AMD EPYC 9654
- **Max MHz:** 3700
- **Nominal:** 2400
- **Enabled:** 192 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:** 384 MB I+D on chip per chip, 32 MB shared / 8 cores
- **Other:** None
- **Memory:** 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
- **Storage:** 1 x 3.84 TB NVMe SSD
- **Other:** None
SPEC CPU®2017 Integer Rate Result

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(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D44N-1U
(2.40 GHz, AMD EPYC 9654)

SPECrate®2017_int_base = 1640
SPECrate®2017_int_peak = Not Run

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>868</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 limit
'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>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
SPEC CPU®2017 Integer Rate Result
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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D44N-1U
(2.40 GHz, AMD EPYC 9654)

SPECRate®2017_int_base = 1640
SPECRate®2017_int_peak = Not Run

CPU2017 License: 9050
Test Sponsor: Quanta Computer Inc.
Tested by: Quanta Computer Inc.
Test Date: Oct-2023
Hardware Availability: Nov-2023
Software Availability: Sep-2023

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
/root/cpu2017/amd_rate_aocc400_znver4_A_lib:/root/cpu2017/amd_rate_aocc400_znver4_A_lib/lib32:
MALLOC_CONF = "retain:true"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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
ACPI CST C2 Latency set to 18
NUMA nodes per socket set to NPS4
Determinism Control is Manual
Determinism Slider set to Power
cTDP Control set to Manual
cTDP set to 400
PPT Control set to Manual
PPT set to 400
ACPI SRAT L3 Cache As NUMA Domain set to Enable

Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on quanta Tue Oct 10 13:06:20 2023

SUT (System Under Test) info as seen by some common utilities.

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1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
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10. who -r
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.7)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged

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Platform Notes (Continued)

20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

------------------------------------------------------------
1. uname -a
   Linux quanta 5.15.0-84-generic #93-Ubuntu SMP Tue Sep 5 17:16:10 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux

2. w
   13:06:20 up 1 min, 1 user, load average: 0.42, 0.27, 0.10
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                13:05    1:40   1.38s  0.07s /bin/bash ./amd_rate_aocc400_znver4_A1.sh

3. Username
   From environment variable $USER: root

4. ulimit -a
   time(seconds) unlimited
   file(blocks) unlimited
   data(kbytes) unlimited
   stack(kbytes) unlimited
   coredump(blocks) 0
   memory(kbytes) unlimited
   locked memory(kbytes) 2097152
   process 6190285
   nofiles 1024000
   vmemory(kbytes) unlimited
   rtprio 0

5. sysinfo process ancestry
   /sbin/init
   /bin/login -f
   -bash
   /bin/bash ./test.sh
   python3 ./run_amd_rate_aocc400_znver4_A1.py
   /bin/bash ./amd_rate_aocc400_znver4_A1.sh
   runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 2 intrate
   runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 2 --nopower
   --runmode rate --tune base --size test:train:refrate:intrate:001.0 /bin/bash ./run_amd_rate_aocc400_znver4_A1.sh
   specperl $SPEC/bin/sysinfo
   $SPEC = /root/cpu2017

6. /proc/cpuinfo
   model name : AMD EPYC 9654 96-Core Processor
   vendor_id : AuthenticAMD
   cpu family : 25
   model : 17
   stepping : 1
   microcode : 0xa10113e
   bugs : sysret_ss_attrss spectre_v1 spectre_v2 spec_store_bypass

(Continued on next page)
Platform Notes (Continued)

TLB size : 3584 4K pages
cpu cores : 96
siblings : 192
2 physical ids (chips)
384 processors (hardware threads)
physical id 0: core ids 0-95
physical id 1: core ids 0-95
physical id 0: apicids 0-191
physical id 1: apicids 256-447
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

----------

7. lscpu

From lscpu from util-linux 2.37.2:

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 384
On-line CPU(s) list: 0-383
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9654 96-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 2
Core(s) per socket: 96
Socket(s): 2
Stepping: 1
Frequency boost: enabled
CPU max MHz: 3707.8120
CPU min MHz: 1500.0000
BogoMIPS: 4792.85
Flags:

Virtualization: AMD-V
L1d cache: 6 MiB (192 instances)
L1i cache: 6 MiB (192 instances)
L2 cache: 192 MiB (192 instances)
L3 cache: 768 MiB (24 instances)
NUMA node(s): 24
NUMA node0 CPU(s): 0-7, 192-199
NUMA node1 CPU(s): 8-15, 200-207
NUMA node2 CPU(s): 16-23, 208-215

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

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

Test Date: Oct-2023
Hardware Availability: Nov-2023
Software Availability: Sep-2023

NUMA node3 CPU(s): 24-31, 216-223
NUMA node4 CPU(s): 32-39, 224-231
NUMA node5 CPU(s): 40-47, 232-239
NUMA node6 CPU(s): 48-55, 240-247
NUMA node7 CPU(s): 56-63, 248-255
NUMA node8 CPU(s): 64-71, 256-263
NUMA node9 CPU(s): 72-79, 264-271
NUMA node10 CPU(s): 80-87, 272-279
NUMA node11 CPU(s): 88-95, 280-287
NUMA node12 CPU(s): 96-103, 288-295
NUMA node13 CPU(s): 104-111, 296-303
NUMA node14 CPU(s): 112-119, 304-311
NUMA node15 CPU(s): 120-127, 312-319
NUMA node16 CPU(s): 128-135, 320-327
NUMA node17 CPU(s): 136-143, 328-335
NUMA node18 CPU(s): 144-151, 336-343
NUMA node19 CPU(s): 152-159, 344-351
NUMA node20 CPU(s): 160-167, 352-359
NUMA node21 CPU(s): 168-175, 360-367
NUMA node22 CPU(s): 176-183, 368-375
NUMA node23 CPU(s): 184-191, 376-383

Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1f: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS always-on, RSB filling, PBRB-eIBRS Not affected
Vulnerability Srbds: Not affected
Vulnerability Tx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
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</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>6M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>6M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
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<tr>
<td>L2</td>
<td>1M</td>
<td>192M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>32M</td>
<td>768M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 24 nodes (0-23)
node 0 cpus: 0-7, 192-199
node 0 size: 64108 MB
node 0 free: 63454 MB
node 1 cpus: 8-15, 200-207
node 1 size: 64507 MB
node 1 free: 64004 MB
node 2 cpus: 16-23, 208-215
node 2 size: 64507 MB
node 2 free: 63881 MB
node 3 cpus: 24-31, 216-223
node 3 size: 64460 MB
node 3 free: 64106 MB
node 4 cpus: 32-39, 224-231
node 4 size: 64507 MB

(Continued on next page)
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(2.40 GHz, AMD EPYC 9654)

SPECrate®2017_int_base = 1640
SPECrate®2017_int_peak = Not Run

Table:

|    | node 0 | node 1 | node 2 | node 3 | node 4 | node 5 | node 6 | node 7 | node 8 | node 9 | node 10 | node 11 | node 12 | node 13 | node 14 | node 15 | node 16 | node 17 | node 18 | node 19 | node 20 | node 21 | node 22 | node 23 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| CPU2017 License: | 9050 |
| Test Date: | Oct-2023 |
| Hardware Availability: | Nov-2023 |
| Software Availability: | Sep-2023 |

Platform Notes (Continued)

node 4 free: 64150 MB
node 5 cpus: 40-47, 232-239
node 5 size: 64507 MB
node 5 free: 64178 MB
node 6 cpus: 48-55, 240-247
node 6 size: 64507 MB
node 6 free: 64198 MB
node 7 cpus: 56-63, 248-255
node 7 size: 64507 MB
node 7 free: 64190 MB
node 8 cpus: 64-71, 256-263
node 8 size: 64507 MB
node 8 free: 64152 MB
node 9 cpus: 72-79, 264-271
node 9 size: 64507 MB
node 9 free: 64120 MB
node 10 cpus: 80-87, 272-279
node 10 size: 64507 MB
node 10 free: 63881 MB
node 11 cpus: 88-95, 280-287
node 11 size: 64507 MB
node 11 free: 64182 MB
node 12 cpus: 96-103, 288-295
node 12 size: 64507 MB
node 12 free: 64270 MB
node 13 cpus: 104-111, 296-303
node 13 size: 64507 MB
node 13 free: 64263 MB
node 14 cpus: 112-119, 304-311
node 14 size: 64507 MB
node 14 free: 64271 MB
node 15 cpus: 120-127, 312-319
node 15 size: 64507 MB
node 15 free: 64266 MB
node 16 cpus: 128-135, 320-327
node 16 size: 64507 MB
node 16 free: 64251 MB
node 17 cpus: 136-143, 328-335
node 17 size: 64507 MB
node 17 free: 64270 MB
node 18 cpus: 144-151, 336-343
node 18 size: 64507 MB
node 18 free: 64253 MB
node 19 cpus: 152-159, 344-351
node 19 size: 64507 MB
node 19 free: 64260 MB
node 20 cpus: 160-167, 352-359
node 20 size: 64507 MB
node 20 free: 64272 MB
node 21 cpus: 168-175, 360-367
node 21 size: 64507 MB
node 21 free: 64248 MB
node 22 cpus: 176-183, 368-375
node 22 size: 64507 MB
node 22 free: 64263 MB
node 23 cpus: 184-191, 376-383
node 23 size: 64447 MB
node 23 free: 64172 MB
node distances: 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

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

0: 10 11 11 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
1: 11 10 11 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
2: 12 12 12 10 11 11 12 12 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
3: 12 12 12 11 10 11 12 12 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
4: 12 12 12 11 10 11 12 12 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
5: 12 12 12 11 10 12 12 12 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
6: 12 12 12 12 12 12 10 11 11 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
7: 12 12 12 12 12 12 11 10 11 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
8: 12 12 12 12 12 12 11 11 10 12 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
9: 12 12 12 12 12 12 12 12 10 11 11 12 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
10: 12 12 12 12 12 12 12 12 12 11 10 11 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32
11: 12 12 12 12 12 12 12 12 12 12 11 10 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32

9. /proc/meminfo
MemTotal: 1584829000 kB

10. who -r
run-level 5 Oct 10 13:04

11. systemd service manager version: systemd 249 (249.11-0ubuntu3.7)
Default Target: graphical

12. Failed units, from systemctl list-units --state=failed
* rc-local.service loaded failed failed /etc/rc.local Compatibility

13. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled ModemManager apparmor blk-availability chrony cloud-config cloud-final cloud-init
cloud-init-local console-setup cron dmesg e2fsck_reap finalrd getty@ gpu-manager
grub-common irqbalance keyboard-setup lm-sensors lvms-monitor lxq-agent multipathd
networkd-dispatcher open-iscsi open-vm-tools pollinate rplcpbind rsyslog secureboot-db
setvtgrbg ssh systemd-networkd systemd-networkd-wait-online systemd-pstore systemd-resolved
therald tuned ua-reboot-oemds ubuntu-advantage udisks2 ubuntu-advantage udisks2 ufset
vgaauth
enabled-runtime netplan-ovs-cleanup rc-local systemd-fsck-root systemd-remount-fs
console-getty debug-shell grub-initrd-fallback ipmiedited iscsid nftables rsync serial-getty@
systat systemd-boot-check-no-failures systemd-network-systemd-sysext
systemd-time-wait-sync upower
generated apport cpufrequtils edac loadcpufreq openipmi
indirect sysstat
masked cryptdisks cryptdisks-early hwclock lvms multipath-tools-boot nfs-common rc rcs
screen-cleanup sudo systemd-timesyncd x11-common

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

14. Linux kernel boot-time arguments, from /proc/cmdline
   `BOOT_IMAGE=/boot/vmlinuz-5.15.0-84-generic`
   `root=UUID=2aa35e7a-56f6-460a-ae69-64654070d9c7`
   `ro`
   `pcie_aspm=off`

15. `cpupower frequency-info` analyzing CPU 0:
   - current policy: frequency should be within 1.50 GHz and 2.40 GHz.
     The governor "performance" may decide which speed to use within this range.
   - boost state support:
     - Supported: yes
     - Active: yes
     - Boost States: 0
     - Total States: 3
     - Pstate-P0: 2400MHz

16. `tuned-adm active`
   Current active profile: latency-performance

17. `sysctl`
   - `kernel.numa_balancing` 1
   - `kernel.randomize_va_space` 0
   - `vm.compartment_proactive"
   - `vm.dirty_background_bytes` 0
   - `vm.dirty_background_ratio` 3
   - `vm.dirty_bytes` 0
   - `vm.dirty_expire_centisecs` 3000
   - `vm.dirty_ratio` 8
   - `vm.dirty_writeback_centisecs` 500
   - `vm.dirtytime_expire_seconds` 432000
   - `vm.extfrag_threshold` 500
   - `vm.min_unmapped_ratio` 1
   - `vm.nr_hugepages` 0
   - `vm.nr_hugepages_mempolicy` 0
   - `vm.nr_overcommit HugePages` 0
   - `vm.swappiness` 1
   - `vm.watermark_boost_factor` 15000
   - `vm.watermark_scale_factor` 10
   - `vm.zone_reclaim_mode` 1

18. `/sys/kernel/mm/transparent_hugepage`
   - `defrag` [always] defer defer+advise madvise never
   - `enabled` [always] madvise never
   - `hpage_pmd_size` 2097152
   - `shm_mem_enabled` always within_size advise [never] deny force

19. `/sys/kernel/mm/transparent_hugepage/khugepaged`
   - `alloc_sleep_millisecs` 60000
   - `defrag` 1
   - `max_ptes_none` 511
   - `max_ptes_shared` 256

(Continued on next page)
## Xeon Phi 8160 Knights Landing Integer Rate Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint 2017</td>
<td>1640</td>
</tr>
<tr>
<td>SPECint 2017 Peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

```
max_ptes_swap              64
pages_to_scan            4096
scan_sleep_millisecs    10000
```

### OS release
```
From /etc/*-release /etc/*-version
os-release Ubuntu 22.04.2 LTS
```

### Disk information
```
SPEC is set to: /root/cpu2017
```
```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p2 ext4  3.5T   32G  3.3T   1% /
```

### BIOS
```
BIOS Vendor:       American Megatrends International, LLC.
BIOS Version:      3A02
BIOS Date:         09/21/2023
BIOS Revision:     5.27
Firmware Revision: 3.24
```

### Compiler Version Notes
```
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
--------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCCLIBCL-1Build#434 2022.10.28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocclibcl-4.0.0/bin
```
```
C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
--------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCCLIBCL-1Build#434 2022.10.28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocclibcl-4.0.0/bin
```

---

(Continued on next page)
Quanta Cloud Technology  
(Test Sponsor: Quanta Computer Inc.)  
QuantaGrid D44N-1U  
(2.40 GHz, AMD EPYC 9654)  

<table>
<thead>
<tr>
<th>Test Date:</th>
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<tr>
<td>CPU2017 License:</td>
<td>9050</td>
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**Compiler Version Notes (Continued)**

Fortran | 548.exchange2_r(base)
---|---
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

**Base Compiler Invocation**

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

**Base Portability Flags**

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
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:
-m64 -flto -Wl,-mlibvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlibvm -Wl,-reduce-array-computations=3
-Wl,-mlibvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mlibvm -unroll-threshold=50
-mlibvm -inline-threshold=1000 -fremap-arrays -fstrip-mining

(Continued on next page)
Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)
QuantaGrid D44N-1U
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SPECrate®2017_int_base = 1640
SPECrate®2017_int_peak = Not Run

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Base Optimization Flags (Continued)

C benchmarks (continued):
-mllvm -reduce-array-computations=3 -zopt -lamlibm -lflang
-lamdalloc

C++ benchmarks:
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamlibm -lflang
-lamdalloc -ext

Fortran benchmarks:
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamlibm
-lflang -lamlacall

Base Other Flags

C benchmarks:
-Wno-unused-command-line-argument

C++ benchmarks:
-Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

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/aocc400-flags-A1.2.xml
| Quanta Cloud Technology  
| Test Sponsor: Quanta Computer Inc.  
| QuantaGrid D44N-1U  
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