SPEC CPU®2017 Integer Speed Result

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

$SPECspeed^{®}2017\_int\_base =$ 13.7

D54Q-2U (Intel Xeon Platinum 8480+, 2.0GHz)

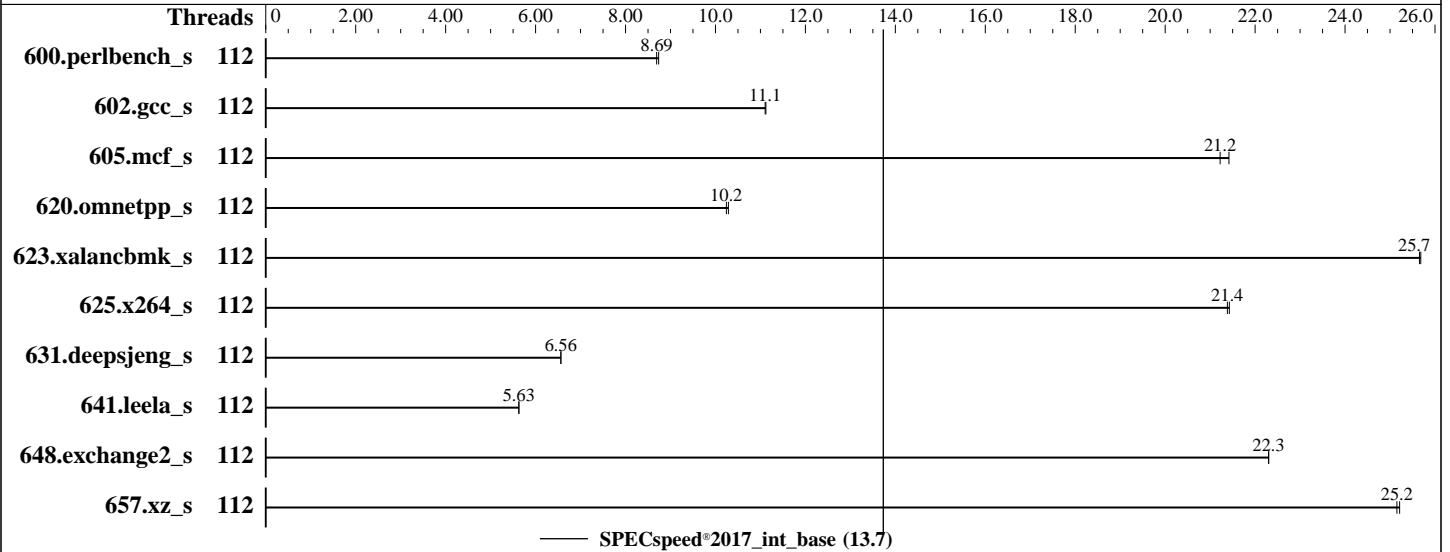$SPECspeed^{®}2017\_int\_peak =$ Not Run

CPU2017 License: 9050   **Test Date:**   Dec-2022
Test Sponsor: Quanta Computer Inc.   **Hardware Availability:** Nov-2022
Tested by: Quanta Computer Inc.   **Software Availability:** Nov-2022

Threads

Benchmark	Threads	Result
600.perlbench_s	112	8.69
602.gcc_s	112	11.1
605.mcf_s	112	21.2
620.omnetpp_s	112	10.2
623.xalancbmk_s	112	25.7
625.x264_s	112	21.4
631.deepsjeng_s	112	6.56
641.leela_s	112	5.63
648.exchange2_s	112	22.3
657.xz_s	112	25.2

—— SPECspeed®2017_int_base (13.7)

Hardware

CPU Name: Intel Xeon Platinum 8480+
 Max MHz: 3800
 Nominal: 2000
Enabled: 112 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 105 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 7.68 TB PCIe 4.0x4 NVMe SSD
Other: None

Software

OS: Ubuntu 22.04.1 LTS
  5.15.0-16-generic
Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++
  Compiler for Linux;
  Fortran: Version 2022.1 of Intel Fortran Compiler
  for Linux;
Parallel: Yes
Firmware: Version 3A10 released Nov-2022
File System: ext4
System State: Run level 5
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance
  at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	112	**204**	**8.69**	203	8.74									
602.gcc_s	112	**359**	**11.1**	358	11.1									
605.mcf_s	112	220	21.4	**222**	**21.2**									
620.omnetpp_s	112	159	10.3	**159**	**10.2**									
623.xalancbmk_s	112	55.2	25.7	**55.2**	**25.7**									
625.x264_s	112	**82.5**	**21.4**	82.3	21.4									
631.deepsjeng_s	112	218	6.56	**218**	**6.56**									
641.leela_s	112	303	5.63	**303**	**5.63**									
648.exchange2_s	112	132	22.3	**132**	**22.3**									
657.xz_s	112	**246**	**25.2**	245	25.2									
SPECspeed®2017_int_base =			**13.7**											
SPECspeed®2017_int_peak =			**Not Run**											

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

Compiler Notes

```
SPEC has ruled that the compiler used for this result was performing a compilation
that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s
benchmarks using a priori knowledge of the SPEC code and dataset to perform a
transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4
https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer
publish results using this optimization.

This result is left in the SPEC results database for historical reference.
```

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/root/cpu2017/lib/intel64:/root/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

General Notes

```
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
```

(Continued on next page)

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General Notes (Continued)

```
Filesystem page cache synced and cleared with:
sync; echo 3>        /proc/sys/vm/drop_caches
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, a general purpose malloc implementation
 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS Configuration
Enable LP [Global] set to Single LP
Patrol Scrub set to Disabled
SNC set to Disabled
DCU Streamer Prefetcher set to Disabled
Hardware P-States set to Out Of Band Mode
LLC dead line alloc set to Disabled

 Sysinfo program /root/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on quanta Fri Dec  2 23:40:32 2022

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

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.4)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
 ------------------------------------------------------------

 ------------------------------------------------------------
 1. uname -a
   Linux quanta 5.15.0-56-generic #62-Ubuntu SMP Tue Nov 22 19:54:14 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
```

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Platform Notes (Continued)

```
    ------------------------------------------------------------
 2. w
    23:40:32 up 0 min,  1 user,  load average: 0.45, 0.14, 0.05
    USER      TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root      tty1       -                23:40   29.00s  0.82s  0.00s /bin/bash ./S6Qtest.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) 132051020
   process               4126150
   nofiles               1024
   vmemory(kbytes)       unlimited
   locks                 unlimited
   rtprio                0


    ------------------------------------------------------------
 5. sysinfo process ancestry
  /sbin/init
  /bin/login -f
  -bash
  /bin/bash ./S6Qtest.sh
  /bin/bash ./S6Qtest.sh
  runcpu --nobuild --action validate --define default-platform-flags -c
    ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=112 --tune base -o all --define
    intspeedaffinity --define drop_caches intspeed -n 2
  runcpu --nobuild --action validate --define default-platform-flags --configfile
    ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=112 --tune base --output_format all --define
    intspeedaffinity --define drop_caches --iterations 2 --nopower --runmode speed --tune base --size refspeed
    intspeed --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.009/templogs/preenv.intspeed.009.0.log
    --lognum 009.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
  $SPEC = /root/cpu2017


    ------------------------------------------------------------
 6. /proc/cpuinfo
    model name       : Intel(R) Xeon(R) Platinum 8480+
    vendor_id        : GenuineIntel
    cpu family       : 6
    model            : 143
    stepping         : 8
    microcode        : 0x2b0000c0
    bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores        : 56
    siblings         : 56
    2 physical ids (chips)
    112 processors (hardware threads)
    physical id 0: core ids 0-55
    physical id 1: core ids 0-55
    physical id 0: apicids
```

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Platform Notes (Continued)

```
      0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72
      ,74,76,78,80,82,84,86,88,90,92,94,96,98,100,102,104,106,108,110
      physical id 1: apicids
      128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
      80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222,224,226,228,230,23
      2,234,236,238
    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:                52 bits physical, 57 bits virtual
      Byte Order:                   Little Endian
      CPU(s):                       112
      On-line CPU(s) list:          0-111
      Vendor ID:                    GenuineIntel
      Model name:                   Intel(R) Xeon(R) Platinum 8480+
      CPU family:                   6
      Model:                        143
      Thread(s) per core:           1
      Core(s) per socket:           56
      Socket(s):                    2
      Stepping:                     8
      BogoMIPS:                     4000.00
      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 tsc_known_freq pni pclmulqdq dtes64 monitor
                                    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 cat_l2 cdp_l3
                                    invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                                    tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2
                                    smep bmi2 erms invpcid 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_occup_llc cqm_mbm_total
                                    cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                                    arat pln pts avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes
                                    vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid
                                    bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear serialize
                                    tsxldtrk pconfig arch_lbr amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d
                                    arch_capabilities
      Virtualization:               VT-x
      L1d cache:                    5.3 MiB (112 instances)
      L1i cache:                    3.5 MiB (112 instances)
      L2 cache:                     224 MiB (112 instances)
      L3 cache:                     210 MiB (2 instances)
      NUMA node(s):                 2
      NUMA node0 CPU(s):            0-55
      NUMA node1 CPU(s):            56-111
      Vulnerability Itlb multihit:  Not affected
      Vulnerability L1tf:           Not affected
      Vulnerability Mds:            Not affected
      Vulnerability Meltdown:       Not affected
      Vulnerability Mmio stale data: Not affected
      Vulnerability Retbleed:       Not affected
```

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Platform Notes (Continued)

```
   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; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBRS SW
                                    sequence
   Vulnerability Srbds:             Not affected
   Vulnerability Tsx async abort:   Not affected


   From lscpu --cache:
       NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL   SETS PHY-LINE COHERENCY-SIZE
       L1d      48K     5.3M   12 Data              1     64       1             64
       L1i      32K     3.5M    8 Instruction       1     64       1             64
       L2        2M     224M   16 Unified           2   2048       1             64
       L3      105M     210M   15 Unified           3 114688       1             64


   ------------------------------------------------------------
   8. numactl --hardware
   NOTE: a numactl 'node' might or might not correspond to a physical chip.
     available: 2 nodes (0-1)
     node 0 cpus: 0-55
     node 0 size: 515572 MB
     node 0 free: 514402 MB
     node 1 cpus: 56-111
     node 1 size: 516076 MB
     node 1 free: 514336 MB
     node distances:
     node   0   1
       0:  10  21
       1:  21  10


   ------------------------------------------------------------
   9. /proc/meminfo
     MemTotal:       1056408172 kB


   ------------------------------------------------------------
   10. who -r
     run-level 5 Dec 2 23:40


   ------------------------------------------------------------
   11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.4)
     Default Target  Status
     graphical       running


   ------------------------------------------------------------
   12. Services, from systemctl list-unit-files
     STATE           UNIT FILES
     enabled         ModemManager apparmor blk-availability cloud-config cloud-final cloud-init
                     cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                     grub-common irqbalance keyboard-setup lvm2-monitor lxd-agent multipathd
                     networkd-dispatcher open-iscsi open-vm-tools pollinate rpcbind rsyslog secureboot-db
                     setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
                     systemd-resolved systemd-timesyncd thermald tuned ua-reboot-cmds ubuntu-advantage udisks2
                     ufw unattended-upgrades vgauth
     enabled-runtime netplan-ovs-cleanup rc-local systemd-fsck-root systemd-remount-fs
     disabled        console-getty debug-shell grub-initrd-fallback ipmievd iscsid nftables rsync serial-getty@
                     sysstat systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                     systemd-time-wait-sync upower
     generated       apport cpufrequtils loadcpufreq openipmi
     indirect        uuidd
     masked          cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot nfs-common rc rcS
                     screen-cleanup sudo x11-common
```

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Platform Notes (Continued)

```
  ----------------------------------------------------------------
  13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.15.0-56-generic
    root=UUID=3fb9636c-5076-4302-a065-9aaccf1a50e3
    ro
    pcie_aspm=off

  ----------------------------------------------------------------
  14. cpupower frequency-info
    analyzing CPU 0:
      Unable to determine current policy
      boost state support:
        Supported: yes
        Active: yes

  ----------------------------------------------------------------
  15. tuned-adm active
    Current active profile: balanced

  ----------------------------------------------------------------
  16. sysctl
    kernel.numa_balancing          1
    kernel.randomize_va_space      2
    vm.compaction_proactiveness    20
    vm.dirty_background_bytes      0
    vm.dirty_background_ratio      10
    vm.dirty_bytes                 0
    vm.dirty_expire_centisecs      3000
    vm.dirty_ratio                 20
    vm.dirty_writeback_centisecs   500
    vm.dirtytime_expire_seconds    43200
    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                  60
    vm.watermark_boost_factor      15000
    vm.watermark_scale_factor      10
    vm.zone_reclaim_mode           0

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

  ----------------------------------------------------------------
  18. /sys/kernel/mm/transparent_hugepage/khugepaged
    alloc_sleep_millisecs  60000
    defrag                 1
    max_ptes_none          511
    max_ptes_shared        256
    max_ptes_swap          64
    pages_to_scan          4096
    scan_sleep_millisecs   10000

  ----------------------------------------------------------------
```

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Platform Notes (Continued)

```
19. OS release
   From /etc/*-release /etc/*-version
   os-release Ubuntu 22.04.1 LTS

   --------------------------------------------------------------
20. Disk information
SPEC is set to: /root/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 ext4  7.0T   84G  6.5T   2% /

   --------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
     Vendor:         Quanta Cloud Technology Inc.
     Product:        QuantaGrid D54Q-2U

   --------------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.3 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 MTC40F2046S1RC48BA1 64 GB 2 rank 4800
     16x NO DIMM NO DIMM

   --------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       American Megatrends International, LLC.
   BIOS Version:      3A10
   BIOS Date:         11/23/2022
   BIOS Revision:     5.29
   Firmware Revision: 3.8
```

Compiler Version Notes

```
==============================================================================================================
C        | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++      | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
Fortran | 648.exchange2_s(base)
--------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------
```

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Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Base Portability Flags

600.perlbench_s: `-DSPEC_LP64 -DSPEC_LINUX_X64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`
623.xalancbmk_s: `-DSPEC_LP64 -DSPEC_LINUX`
625.x264_s: `-DSPEC_LP64`
631.deepsjeng_s: `-DSPEC_LP64`
641.leela_s: `-DSPEC_LP64`
648.exchange2_s: `-DSPEC_LP64`
657.xz_s: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
`-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp`
`-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

C++ benchmarks:
`-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Fortran benchmarks:
`-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-nostandard-realloc-lhs -align array32byte`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

SPEC CPU®2017 Integer Speed Result

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

D54Q-2U (Intel Xeon Platinum 8480+, 2.0GHz)

SPECspeed®2017_int_base = 13.7

SPECspeed®2017_int_peak = Not Run

CPU2017 License:	9050		**Test Date:**	Dec-2022
Test Sponsor:	Quanta Computer Inc.		**Hardware Availability:**	Nov-2022
Tested by:	Quanta Computer Inc.		**Software Availability:**	Nov-2022

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.html
http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-Eagle_Stream-Platform-Settings-V1.1.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-Eagle_Stream-Platform-Settings-V1.1.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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