



SPEC CPU®2017 Floating Point Speed Result

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Quanta Cloud Technology

(Test Sponsor: Quanta Computer Inc.)

D55Q-2U (Intel Xeon 6787P)

SPECspeed®2017_fp_base = 415

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9050

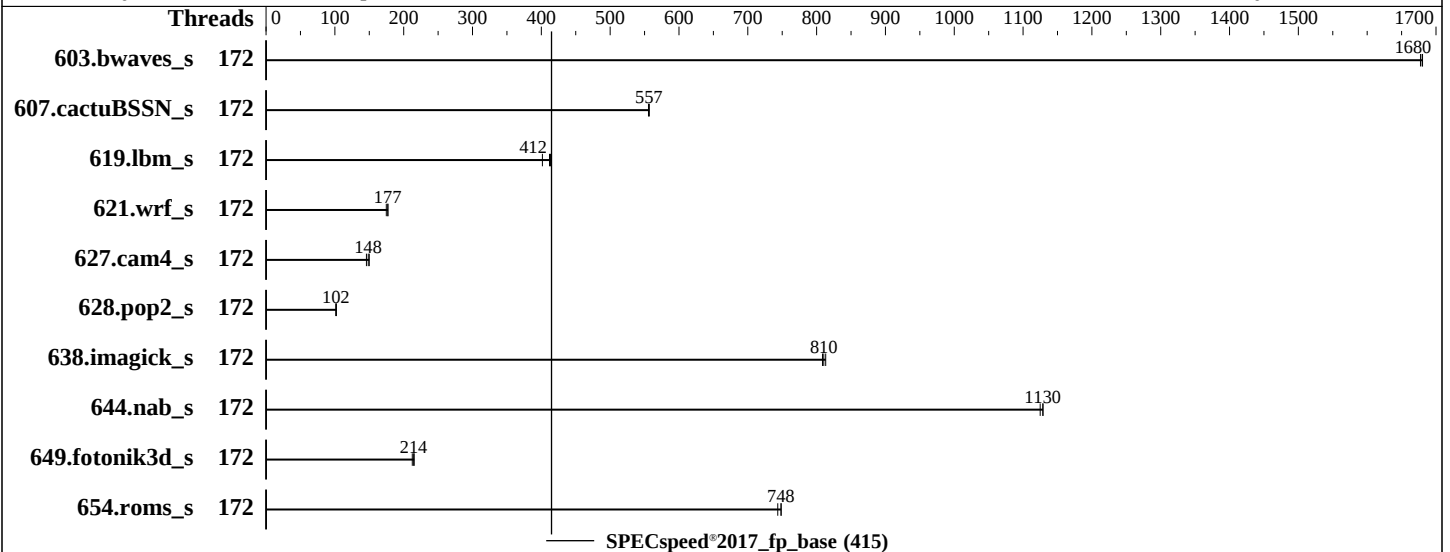
Test Sponsor: Quanta Computer Inc.

Tested by: Quanta Computer Inc.

Test Date: Jun-2025

Hardware Availability: Feb-2025

Software Availability: Jun-2024



Hardware

CPU Name: Intel Xeon 6787P
Max MHz: 3800
Nominal: 2000
Enabled: 172 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 64 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 336 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-88/56B-M, running at 8000)
Storage: 960 GB on xfs
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6
6.4.0-150600.21-default
Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 3A16.QCT001 released Mar-2025
File System: xfs
System State: Run level 3 (multi-user)
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
603.bwaves_s	172	35.1	1680	<u>35.1</u>	<u>1680</u>	35.2	1680							
607.cactuBSSN_s	172	<u>30.0</u>	<u>557</u>	30.0	556	29.9	557							
619.lbm_s	172	<u>12.7</u>	<u>412</u>	13.0	402	12.7	413							
621.wrf_s	172	<u>74.8</u>	<u>177</u>	75.7	175	74.7	177							
627.cam4_s	172	<u>59.7</u>	<u>148</u>	59.1	150	60.8	146							
628.pop2_s	172	<u>117</u>	<u>102</u>	116	102	117	102							
638.imagick_s	172	17.7	813	17.8	809	<u>17.8</u>	<u>810</u>							
644.nab_s	172	<u>15.5</u>	<u>1130</u>	15.5	1120	15.5	1130							
649.fotonik3d_s	172	<u>42.5</u>	<u>214</u>	42.3	215	42.9	212							
654.roms_s	172	<u>21.0</u>	<u>748</u>	21.0	748	21.2	744							

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

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,compact"

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

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>



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Platform Notes

BIOS Configuration

Hardware P-States set to Disable
Package C State set to C6(non Retention) state
Energy/Performance Bias set to Performance
Enable LP [Global] set to Single LP
SNC set to Disable
LLC Prefetch set to Enable

Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Jun 24 12:25:44 2025

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 254 (254.10+suse.84.ge8d77af424)
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 localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
x86_64 x86_64 x86_64 GNU/Linux

2. w
12:25:44 up 4:28, 4 users, load average: 69.71, 129.00, 114.83
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 07:58 4:27m 0.19s 0.19s -bash
root pts/0 192.168.118.1 07:59 25:20 1.06s 0.00s /bin/bash ./test.sh
root pts/1 192.168.118.1 08:02 4:23m 0.05s 0.05s -bash

3. Username
From environment variable \$USER: root

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Platform Notes (Continued)

```
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 4124298
max locked memory       (kbytes, -l) unlimited
max memory size         (kbytes, -m) unlimited
open files              (-n) 1024000
pipe size               (512 bytes, -p) 8
POSIX message queues    (bytes, -q) 819200
real-time priority      (-r) 0
stack size              (kbytes, -s) unlimited
cpu time                (seconds, -t) unlimited
max user processes      (-u) 4124298
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@pts/0
-bash
/bin/bash ./test.sh
/bin/bash ./test.sh
runcpu --nobuild --action validate --define default-platform-flags -c
ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=172 --tune base -o all --define drop_caches
fpspeed
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=172 --tune base --output_format all --define
drop_caches --nopower --runmode speed --tune base --size refspeed fpspeed --nopreenv --note-preenv
--logfile $SPEC/tmp/CPU2017.145/temlogs/preenv.fpspeed.145.0.log --lognum 145.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /root/cpu2017

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) 6787P
vendor_id      : GenuineIntel
cpu family     : 6
model          : 173
stepping       : 1
microcode      : 0x1000380
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
cpu cores      : 86
siblings       : 86
2 physical ids (chips)
172 processors (hardware threads)
physical id 0: core ids 0-42,64-106
physical id 1: core ids 0-42,64-106
physical id 0: apicids
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
,74,76,78,80,82,84,128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,17
0,172,174,176,178,180,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212
physical id 1: apicids
256,258,260,262,264,266,268,270,272,274,276,278,280,282,284,286,288,290,292,294,296,298,300,302,304,306,3
08,310,312,314,316,318,320,322,324,326,328,330,332,334,336,338,340,384,386,388,390,392,394,396,398,400,40
2,404,406,408,410,412,414,416,418,420,422,424,426,428,430,432,434,436,438,440,442,444,446,448,450,452,454
```

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Platform Notes (Continued)

, 456, 458, 460, 462, 464, 466, 468

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 2.39.3:

```
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):                172
On-line CPU(s) list:   0-171
Vendor ID:             GenuineIntel
BIOS Vendor ID:        Intel(R) Corporation
Model name:            Intel(R) Xeon(R) 6787P
BIOS Model name:       Intel(R) Xeon(R) 6787P   CPU @ 2.0GHz
BIOS CPU family:       179
CPU family:            6
Model:                 173
Thread(s) per core:    1
Core(s) per socket:    86
Socket(s):             2
Stepping:              1
CPU(s) scaling MHz:    26%
CPU max MHz:           3800.0000
CPU min MHz:           800.0000
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 intel_ppin cdp_l2
                    ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept
                    vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid
                    rtm 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 user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida
                    arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req vnmi 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 ibt amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d
                    arch_capabilities
Virtualization:         VT-x
L1d cache:              8.1 MiB (172 instances)
L1i cache:              10.8 MiB (172 instances)
L2 cache:               344 MiB (172 instances)
L3 cache:               672 MiB (2 instances)
NUMA node(s):          2
NUMA node0 CPU(s):     0-85
NUMA node1 CPU(s):     86-171
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:      Not affected
Vulnerability L1tf:            Not affected
```

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Platform Notes (Continued)

Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling; PBRSE-eIBRS Not affected; BHI BHI_DIS_S
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	8.1M	12	Data	1	64	1	64
L1i	64K	10.8M	16	Instruction	1	64	1	64
L2	2M	344M	16	Unified	2	2048	1	64
L3	336M	672M	16	Unified	3	344064	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: 0-85

node 0 size: 515441 MB

node 0 free: 513651 MB

node 1 cpus: 86-171

node 1 size: 515659 MB

node 1 free: 509989 MB

node distances:

node 0 1

0: 10 21

1: 21 10

9. /proc/meminfo

MemTotal: 1055847336 kB

10. who -r

run-level 3 Jun 24 07:58

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)

Default Target Status

multi-user running

12. Services, from systemctl list-unit-files

STATE UNIT FILES

enabled YaST2-Firstboot apparmor auditd cron getty@ irqbalance issue-generator kbdsettings postfix
purge-kernels rollback sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4
wickedd-dhcp6 wickedd-nanny

enabled-runtime systemd-remount-fs

disabled YaST2-Second-Stage autofs autoyast-initscripts blk-availability boot-sysctl
ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell
display-manager ebttables exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged
hwloc-dump-hwdata ipmi ipmievd issue-add-ssh-keys kdump kdump-early kdump-notify
kexec-load klog lunmask lvm2-monitor man-db-create multipathd nfs nfs-blkmap nsd

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Platform Notes (Continued)

indirect
nvme-fc-boot-connections nvme-fc-autoconnect rpcbind rpmconfigcheck rsyncd rsyslog
serial-getty@ smartd smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures
systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync
systemd-timesyncd tuned udisks2 vncserver@
systemd-userdbd wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline

BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=ef37f719-a8b7-425b-a775-187849075d47
mitigations=auto
quiet
security=apparmor
crashkernel=372M,high
crashkernel=72M,low

14. cpupower frequency-info

analyzing CPU 6:
current policy: frequency should be within 800 MHz and 3.80 GHz.
The governor "performance" may decide which speed to use
within this range.
boost state support:
Supported: yes
Active: yes

15. tuned-adm active

It seems that tuned daemon is not running, preset profile is not activated.
Preset 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+madvice [madvice] never
enabled	[always] madvice never
hpage_pmd_size	2097152
shmem_enabled	always within_size advise [never] deny force

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Platform Notes (Continued)

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
```

19. OS release

```
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP6
```

20. Disk information

SPEC is set to: /root/cpu2017

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme1n1p1 xfs 615G 50G 565G 9% /
```

21. /sys/devices/virtual/dmi/id

```
Vendor: Quanta Cloud Technology Inc.
Product: QuantaGrid D55Q-2U
```

22. dmidecode

Additional information from dmidecode 3.4 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:

```
2x Samsung M327R8GA0EB0-CLVWB 64 GB 2 rank 11200, configured at 8000
14x Samsung M327R8GA0EB0-CLVXB 64 GB 2 rank 11200, configured at 8000
```

23. BIOS

(This section combines info from /sys/devices and dmidecode.)

```
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 3A16.QCT001
BIOS Date: 03/20/2025
BIOS Revision: 5.35
Firmware Revision: 3.16
```

Compiler Version Notes

=====
C | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
=====

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
=====

=====
C++, C, Fortran | 607.cactuBSSN_s(base)
=====

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308

Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

Fortran | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308

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Fortran, C | 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308

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Base Compiler Invocation

C benchmarks:

icx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Base Portability Flags

603.bwaves_s: -DSPEC_LP64

607.cactuBSSN_s: -DSPEC_LP64

619.lbm_s: -DSPEC_LP64

621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian

627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG

628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian

-assume byterecl

638.imagick_s: -DSPEC_LP64

(Continued on next page)



SPEC CPU®2017 Floating Point Speed Result

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Quanta Cloud Technology

(Test Sponsor: Quanta Computer Inc.)

D55Q-2U (Intel Xeon 6787P)

SPECspeed®2017_fp_base = 415

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9050

Test Sponsor: Quanta Computer Inc.

Tested by: Quanta Computer Inc.

Test Date: Jun-2025

Hardware Availability: Feb-2025

Software Availability: Jun-2024

Base Portability Flags (Continued)

644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:

-w -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:

-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:

-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte
-auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.html>

http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-Birch_Stream-Platform-Settings-V1.4.html

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

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml>

http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-Birch_Stream-Platform-Settings-V1.4.xml



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