



# SPEC CPU®2017 Integer Speed Result

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## Tyrone Systems

(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero QS400TU-224R4  
(2.00 GHz, Intel Xeon Gold 5117)

SPECspeed®2017\_int\_base = 8.05

SPECspeed®2017\_int\_peak = 8.17

CPU2017 License: 006042

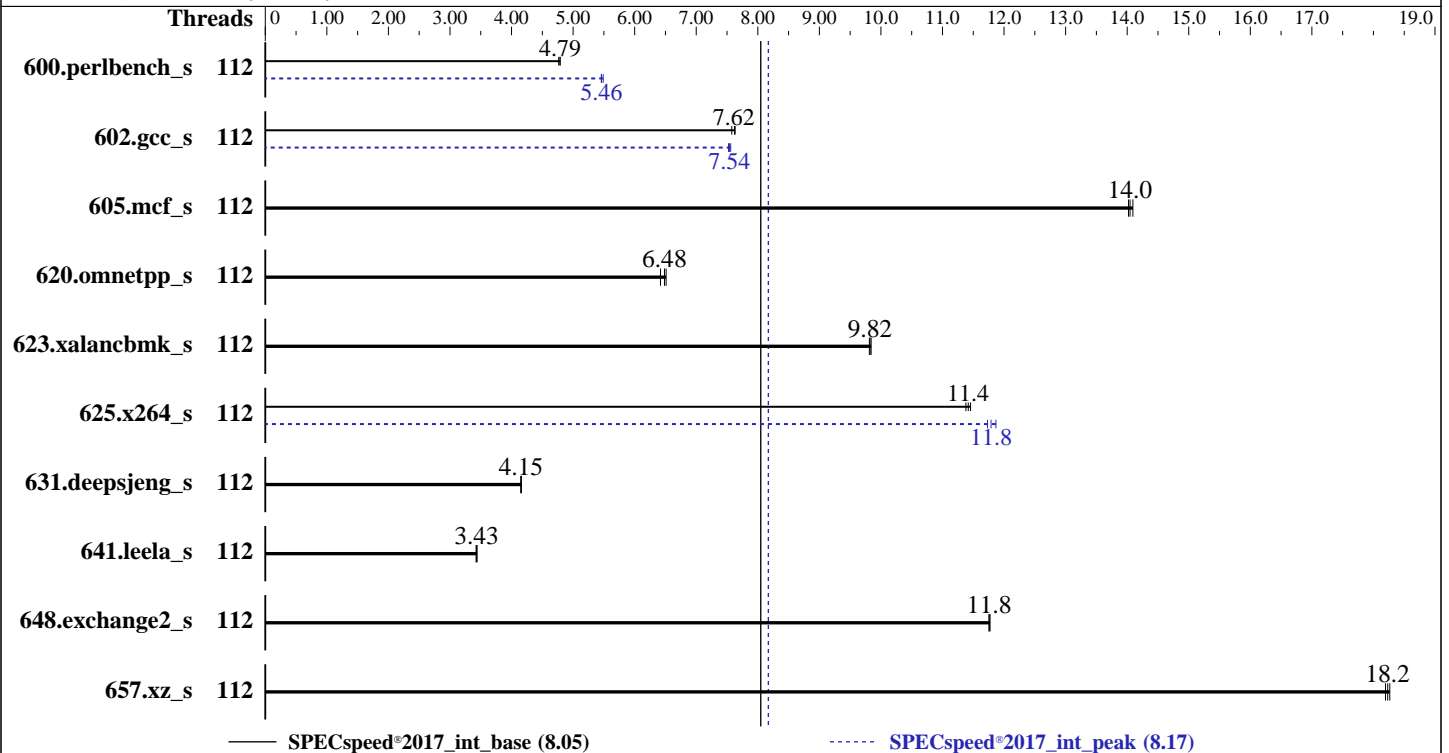
Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Feb-2021

Hardware Availability: Aug-2020

Software Availability: Dec-2020



### Hardware

CPU Name: Intel Xeon Gold 5117  
 Max MHz: 2800  
 Nominal: 2000  
 Enabled: 56 cores, 4 chips, 2 threads/core  
 Orderable: 1,2,4 (chip)s  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 19.25 MB I+D on chip per chip  
 Other: None  
 Memory: 384 GB (24 x 16 GB 1Rx4 PC4-2933Y-R, running at 2400)  
 Storage: 1 x 480 GB SATA SSD  
 Other: None

### Software

OS: CentOS Linux release 8.3.2011  
 Kernel 4.18.0-240.el8.x86\_64  
 4.18.0-240.el8.x86\_64  
 Compiler: C/C++: Version 19.1.2.254 of Intel C/C++ Compiler for Linux Build 20200623;  
 Fortran: Version 19.1.2.254 of Intel Fortran Compiler for Linux Build 20200623;  
 Parallel: Yes  
 Firmware: Version 3.4 released Nov-2020  
 File System: xfs  
 System State: Run level 3 (multi user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc memory allocator V5.0.1  
 Power Management: BIOS 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	371	4.79	372	4.77	<b>371</b>	<b>4.79</b>	112	323	5.49	<b>325</b>	<b>5.46</b>	325	5.46
602.gcc_s	112	526	7.58	522	7.63	<b>522</b>	<b>7.62</b>	112	527	7.56	<b>528</b>	<b>7.54</b>	529	7.52
605.mcf_s	112	337	14.0	335	14.1	<b>336</b>	<b>14.0</b>	112	337	14.0	335	14.1	<b>336</b>	<b>14.0</b>
620.omnetpp_s	112	254	6.42	251	6.51	<b>252</b>	<b>6.48</b>	112	254	6.42	251	6.51	<b>252</b>	<b>6.48</b>
623.xalancbmk_s	112	144	9.81	<b>144</b>	<b>9.82</b>	144	9.84	112	144	9.81	<b>144</b>	<b>9.82</b>	144	9.84
625.x264_s	112	154	11.5	<b>154</b>	<b>11.4</b>	155	11.4	112	150	11.7	<b>150</b>	<b>11.8</b>	149	11.9
631.deepsjeng_s	112	345	4.16	<b>345</b>	<b>4.15</b>	345	4.15	112	345	4.16	<b>345</b>	<b>4.15</b>	345	4.15
641.leela_s	112	498	3.42	<b>497</b>	<b>3.43</b>	496	3.44	112	498	3.42	<b>497</b>	<b>3.43</b>	496	3.44
648.exchange2_s	112	250	11.8	250	11.8	<b>250</b>	<b>11.8</b>	112	250	11.8	250	11.8	<b>250</b>	<b>11.8</b>
657.xz_s	112	<b>339</b>	<b>18.2</b>	338	18.3	340	18.2	112	<b>339</b>	<b>18.2</b>	338	18.3	340	18.2

SPECspeed®2017\_int\_base = **8.05**

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

## Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.

The correct version of C/C++ compiler is: Version 19.1.2.254 Build 20200623 Compiler for Linux

The correct version of Fortran compiler is: Version 19.1.2.254 Build 20200623 Compiler for Linux

## 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 = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"

MALLOC\_CONF = "retain:true"

OMP\_STACKSIZE = "192M"

## General Notes

Binaries compiled on a system with 2x Intel Cascade Lake 4214R CPU + 384 GB RAM memory using Centos 8.2 x84\_64

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```
sync; echo 3> /proc/sys/vm/drop_caches
```

(Continued on next page)



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## General Notes (Continued)

Yes: 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 Settings:

Power Technology = Custom

Power Performance Tuning = BIOS Controls EPB

ENERGY\_PERF\_BIAS\_CFG mode = Maximum Performance

SNC = Enable

Stale AtoS = Disable

IMC Interleaving = 1-way Interleave

Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c

running on localhost.localdomain Tue Feb 23 23:40:36 2021

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

For more information on this section, see

<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Gold 5117 CPU @ 2.00GHz

4 "physical id"s (chips)

112 "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 : 14

siblings : 28

physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

(Continued on next page)



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## Platform Notes (Continued)

```

CPU(s): 112
On-line CPU(s) list: 0-111
Thread(s) per core: 2
Core(s) per socket: 14
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5117 CPU @ 2.00GHz
Stepping: 4
CPU MHz: 2356.105
CPU max MHz: 2800.0000
CPU min MHz: 800.0000
BogoMIPS: 4000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 19712K
NUMA node0 CPU(s): 0-13,56-69
NUMA node1 CPU(s): 14-27,70-83
NUMA node2 CPU(s): 28-41,84-97
NUMA node3 CPU(s): 42-55,98-111
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
aperfperf 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 cdp_l3
invpcid_single pti intel_ppin ssbd mba ibrs ibpb stibp tpr_shadow vnmi flexpriority
ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx
rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw
avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local dtherm ida arat pln pts pku ospke md_clear flush_lld

```

```

/proc/cpuinfo cache data
cache size : 19712 KB

```

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 56 57 58 59 60 61 62 63 64 65 66 67 68 69
node 0 size: 91466 MB
node 0 free: 76323 MB
node 1 cpus: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 70 71 72 73 74 75 76 77 78 79 80
81 82 83

```

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## Platform Notes (Continued)

```

node 1 size: 93133 MB
node 1 free: 79876 MB
node 2 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 84 85 86 87 88 89 90 91 92 93 94
95 96 97
node 2 size: 93105 MB
node 2 free: 80041 MB
node 3 cpus: 42 43 44 45 46 47 48 49 50 51 52 53 54 55 98 99 100 101 102 103 104 105
106 107 108 109 110 111
node 3 size: 92597 MB
node 3 free: 79820 MB
node distances:
node  0  1  2  3
  0:  10  21  31  21
  1:  21  10  21  31
  2:  31  21  10  21
  3:  21  31  21  10

```

From /proc/meminfo

MemTotal: 394593460 kB

HugePages\_Total: 0

Hugepagesize: 2048 kB

/sbin/tuned-adm active

Current active profile: throughput-performance

/sys/devices/system/cpu/cpu\*/cpufreq/scaling\_governor has  
performance

From /etc/\*release\* /etc/\*version\*

centos-release: CentOS Linux release 8.3.2011

centos-release-upstream: Derived from Red Hat Enterprise Linux 8.3

os-release:

NAME="CentOS Linux"

VERSION="8"

ID="centos"

ID\_LIKE="rhel fedora"

VERSION\_ID="8"

PLATFORM\_ID="platform:el8"

PRETTY\_NAME="CentOS Linux 8"

ANSI\_COLOR="0;31"

redhat-release: CentOS Linux release 8.3.2011

system-release: CentOS Linux release 8.3.2011

system-release-cpe: cpe:/o:centos:centos:8

uname -a:

Linux localhost.localdomain 4.18.0-240.el8.x86\_64 #1 SMP Fri Sep 25 19:48:47 UTC 2020  
x86\_64 x86\_64 x86\_64 GNU/Linux

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## Platform Notes (Continued)

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):

CVE-2018-3620 (L1 Terminal Fault):

Microarchitectural Data Sampling:

CVE-2017-5754 (Meltdown):

CVE-2018-3639 (Speculative Store Bypass):

CVE-2017-5753 (Spectre variant 1):

CVE-2017-5715 (Spectre variant 2):

CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected

CVE-2019-11135 (TSX Asynchronous Abort):

KVM: Mitigation: Split huge pages  
Mitigation: PTE Inversion; VMX:  
conditional cache flushes, SMT  
vulnerable

Mitigation: Clear CPU buffers; SMT  
vulnerable

Mitigation: PTI

Mitigation: Speculative Store  
Bypass disabled via prctl and  
seccomp

Mitigation: usercopy/swaps  
barriers and \_\_user pointer  
sanitization

Mitigation: Full generic  
retpoline, IBPB: conditional,  
IBRS\_FW, STIBP: conditional, RSB  
filling

Mitigation: Clear CPU buffers; SMT  
vulnerable

run-level 3 Feb 22 00:14

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/cl-home	xfs	372G	108G	265G	30%	/home

From /sys/devices/virtual/dmi/id

```
Vendor:      Tyrone Systems
Product:    Tyrone Camarero DS400TU-224R4
Product Family: SMC X11
Serial:    123456789
```

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:

```
24x NO DIMM NO DIMM
24x Samsung M393A2K40DB2-CVF 16 GB 1 rank 2933, configured at 2400
```

BIOS:

```
BIOS Vendor:    American Megatrends Inc.
BIOS Version:   3.4
```

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## Platform Notes (Continued)

BIOS Date: 11/04/2020

BIOS Revision: 5.14

(End of data from sysinfo program)

## Compiler Version Notes

```
=====
C          | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
          | 625.x264_s(base, peak) 657.xz_s(base, peak)
=====
```

```
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
icc (NextGen): command line warning #10006: ignoring unknown option
'-i_version=19.1.2.254' [-Woption-ignored]
=====
```

```
=====
C          | 600.perlbench_s(peak)
=====
```

```
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.2.254 Build 20200623
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
=====
```

```
=====
C          | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
          | 625.x264_s(base, peak) 657.xz_s(base, peak)
=====
```

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icc (NextGen): command line warning #10006: ignoring unknown option
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=====
```

```
=====
C          | 600.perlbench_s(peak)
=====
```

```
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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=====
```

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## Compiler Version Notes (Continued)

```
C++ | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
    | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
```

```
-----
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
icpc (NextGen): command line warning #10006: ignoring unknown option
'-i_version=19.1.2.254' [-Woption-ignored]
-----
```

```
=====  
Fortran | 648.exchange2_s(base, peak)
```

```
-----
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.2.254 Build 20200623
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----
```

## Base Compiler Invocation

C benchmarks:  
icc

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

## 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
```





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## Base Optimization Flags

C benchmarks:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

C++ benchmarks:

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.2.254/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:

```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries
```

## Peak Compiler Invocation

C benchmarks:

```
icc
```

C++ benchmarks:

```
icpc
```

Fortran benchmarks:

```
ifort
```

## Peak Portability Flags

```
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gc_s: -DSPEC_LP64(*) -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
```

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## Peak Portability Flags (Continued)

648.exchange2\_s: -DSPEC\_LP64

657.xz\_s: -DSPEC\_LP64

(\*) Indicates a portability flag that was found in a non-portability variable.

## Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
602.gcc_s: -m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

605.mcf\_s: basepeak = yes

```
625.x264_s: -m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

657.xz\_s: basepeak = yes

C++ benchmarks:

620.omnetpp\_s: basepeak = yes

623.xalancbmk\_s: basepeak = yes

631.deepsjeng\_s: basepeak = yes

641.leela\_s: basepeak = yes

Fortran benchmarks:

(Continued on next page)



# SPEC CPU®2017 Integer Speed Result

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**Tyrone Systems**

(Test Sponsor: Netweb Pte Ltd)

**Tyrone Camarero QS400TU-224R4**  
(2.00 GHz, Intel Xeon Gold 5117)

SPECspeed®2017\_int\_base = 8.05

SPECspeed®2017\_int\_peak = 8.17

**CPU2017 License:** 006042

**Test Sponsor:** Netweb Pte Ltd

**Tested by:** Tyrone Systems

**Test Date:** Feb-2021

**Hardware Availability:** Aug-2020

**Software Availability:** Dec-2020

## Peak Optimization Flags (Continued)

648.exchange2\_s:basepeak = yes

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

[http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64\\_revA.html](http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.html)

<http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revB.html>

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

[http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64\\_revA.xml](http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.xml)

<http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revB.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.5 on 2021-02-23 23:40:35-0500.

Report generated on 2021-03-16 15:28:50 by CPU2017 PDF formatter v6255.

Originally published on 2021-03-16.