## SPEC CPU®2017 Floating Point Speed Result

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
Tyrone Camarero DS400E1U-224R4  
(2.60 GHz, Intel Xeon Gold 6240)

<table>
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<th>SPECspeed®2017_fp_peak = 124</th>
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<td>720</td>
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</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6240  
- **Max MHz:** 3900  
- **Nominal:** 2600  
- **Enabled:** 36 cores, 2 chips, 2 threads/core  
- **Orderable:** 1.2 (chip)  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage:** 1 x 480 GB SATA SSD  
- **Other:** None

### Software

- **OS:** CentOS Linux release 8.3.2011  
  4.18.0-240.el8.x86_64  
- **Compiler:**  
  C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux Build 20200306;  
  Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux Build 20200306;  
- **Parallel:** Yes  
- **Firmware:** Version 3.4 released Oct-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
Tyrone Systems  
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Tyrone Camarero DS400E1U-224R4  
(2.60 GHz, Intel Xeon Gold 6240)

SPECspeed®2017_fp_base = 122
SPECspeed®2017_fp_peak = 124

Results Table

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</table>

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 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 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,compact,1,0"
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 CPU + 384GB RAM memory using Centos 8.2 x86_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)
SPEC CPU®2017 Floating Point Speed Result

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero DS400E1U-224R4
(2.60 GHz, Intel Xeon Gold 6240)

SPECspeed®2017_fp_base = 122
SPECspeed®2017_fp_peak = 124

General Notes (Continued)

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 Centos 8.2 x86_64, and the system compiler gcc 8.3.1 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 = Extreme 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 spec Tue Feb 2 20:31:29 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 6240 CPU @ 2.60GHz
  - 2 "physical id"s (chips)
  - 72 "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: 18
siblings: 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 72
- On-line CPU(s) list: 0-71

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

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SPECspeed®2017_fp_base = 122
SPECspeed®2017_fp_peak = 124

CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Platform Notes (Continued)

Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6240 CPU @ 2.60GHz
Stepping: 7
CPU MHz: 3300.016
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-2, 5, 6, 9, 10, 14, 15, 36-38, 41, 42, 45, 46, 50-51
NUMA node1 CPU(s): 3, 4, 7, 8, 11-13, 16, 17, 39, 40, 43, 44, 47-49, 52, 53
NUMA node2 CPU(s): 18-20, 23, 24, 27, 28, 32, 33, 54-56, 59, 60, 63, 64, 68, 69
NUMA node3 CPU(s): 21, 22, 25, 26, 29-31, 34, 35, 37, 57, 58, 61, 62, 65-67, 70, 71
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpcrf pni pclmulqdq dtstes64 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
rdand lahlf_m abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single
intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced fsbsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid cqm mp xdt_a avx512f avx512dq rdseng adx clflushopt
clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves cqm_llc
cqm_occup_llc cqm_bb_total cqm_bb_local dtherm ida arat pln pts pkup ospe
avx512_vnni md_clear flush_l1d arch_capabilities

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 5 6 9 10 14 15 36 37 38 41 42 45 46 50 51
node 0 size: 91216 MB
node 0 free: 81519 MB
node 1 cpus: 3 4 7 8 11 12 13 16 17 39 40 43 44 47 48 49 52 53
node 1 size: 92482 MB
node 1 free: 84794 MB
node 2 cpus: 18 19 20 23 24 27 28 32 33 54 55 56 59 60 63 64 68 69

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

**Tyrone Systems**  
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**Tyrone Camarero DS400E1U-224R4**  
(2.60 GHz, Intel Xeon Gold 6240)

<table>
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<tr>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<td>122</td>
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**CPU2017 License:** 006042  
**Test Date:** Feb-2021  
**Test Sponsor:** Netweb Pte Ltd  
**Hardware Availability:** Aug-2020  
**Tested by:** Tyrone Systems  
**Software Availability:** Dec-2020

**Platform Notes (Continued)**

- node 2 size: 92275 MB
- node 2 free: 84920 MB
- node 3 cpus: 21 22 25 26 29 30 31 34 35 58 61 62 65 66 67 70 71
- node 3 size: 91679 MB
- node 3 free: 78946 MB
- node distances:
  - node 0 1 2 3
    - 0: 10 11 21 21
    - 1: 11 10 21 21
    - 2: 21 21 10 11
    - 3: 21 21 11 10

From /proc/meminfo

- MemTotal: 394860620 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 spec 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

Kernel self-reported vulnerability status:

- CVE-2018-12207 (iTLB Multihit): KVM: Mitigation: Split huge pages  
  Not affected
- CVE-2018-3620 (L1 Terminal Fault):
SPEC CPU®2017 Floating Point Speed Result

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Tyrone Systems

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CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Test Date: Feb-2021
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Hardware Availability: Aug-2020
Software Availability: Dec-2020

Platform Notes (Continued)

Microarchitectural Data Sampling:
CVE-2017-5754 (Meltdown): Not affected
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):
CVE-2019-11135 (TSX Asynchronous Abort):

Mitigation: Speculative Store Bypass disabled via prctl and seccomp
Mitigation: usercopy/swapgs barriers and __user pointer sanitization
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
Mitigation: TSX disabled

run-level 3 Feb 1 11:28
SPEC is set to: /home/cpu2017
Filesystem          Type  Size  Used Avail Use% Mounted on
/dev/mapper/cl-home xfs   372G  156G  216G  42% /home
From /sys/devices/virtual/dmi/id
Vendor:         Tyrone Systems
Product:        Tyrone Camarero DS400E1
Serial:         S263875X9527668

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:
12x NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

BIOS:
BIOS Vendor:       American Megatrends Inc.
BIOS Version:      3.4
BIOS Date:         10/30/2020
BIOS Revision:     5.14

(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) |
------------------------------------------------------------------------------
(Continued on next page)
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CPU2017 License: 006042
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Tested by: Tyrone Systems

Test Date: Feb-2021
Hardware Availability: Aug-2020
Software Availability: Dec-2020

Compiler Version Notes (Continued)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                    | 654.roms_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.1.217 Build 20200306
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------------------------------------------------------------------------------
Fortran, C        | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                    | 628.pop2_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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Base Compiler Invocation

C benchmarks:
  icc

(Continued on next page)
### Base Compiler Invocation (Continued)

Fortran benchmarks:
```bash
tifort
```

Benchmarks using both Fortran and C:
```bash
tifort icc
```

Benchmarks using Fortran, C, and C++:
```bash
icpc icc tifort
```

### Base Portability Flags

<table>
<thead>
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<th>Benchmark</th>
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<td>-DSPEC_LP64</td>
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<tr>
<td>619.lbm_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>-DSPEC_LP64</td>
</tr>
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<td>644.nab_s</td>
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</table>

### Base Optimization Flags

#### C benchmarks:
```bash
-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -mbranches-within-32B-boundaries
```

#### Fortran benchmarks:
```bash
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs -mbranches-within-32B-boundaries -L/usr/local/je5.0.1-64/lib -ljemalloc
```

#### Benchmarks using both Fortran and C:
```bash
```

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result
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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero DS400E1U-224R4
(2.60 GHz, Intel Xeon Gold 6240)

SPECspeed®2017_fp_base = 122
SPECspeed®2017_fp_peak = 124

CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Feb-2021
Hardware Availability: Aug-2020
Software Availability: Dec-2020

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
-`-m64` `-std=c11` `-Wl,-z,muldefs` `-xCORE-AVX512` `-ipo` `-O3` `-no-prec-div`
-`-qopt-prefetch` `-ffinite-math-only` `-qopt-mem-layout-trans=4` `-qopenmp`
-`-DSPEC_OPENMP` `-mbranches-within-32B-boundaries` `-nostandard-realloc-lhs`
-`-L/usr/local/je5.0.1-64/lib` `-ljemalloc`

Peak Compiler Invocation

C benchmarks:
`icc`

Fortran benchmarks:
`ifort`

Benchmarks using both Fortran and C:
`ifort icc`

Benchmarks using Fortran, C, and C++:
`icpc icc ifort`

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: `-m64` `-std=c11` `-Wl,-z,muldefs` `-xCORE-AVX512` `-ipo` `-O3`
-`-no-prec-div` `-qopt-prefetch` `-ffinite-math-only`
-`-qopt-mem-layout-trans=4` `-qopenmp` `-DSPEC_OPENMP`
-`-mbranches-within-32B-boundaries`
-`-L/usr/local/je5.0.1-64/lib` `-ljemalloc`

Fortran benchmarks:

(Continued on next page)
Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero DS400E1U-224R4
(2.60 GHz, Intel Xeon Gold 6240)

SPECspeed®2017_fp_base = 122
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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)

603.bwaves_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512
-03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -gopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries
-L/usr/local/je5.0.1-64/lib -ljemalloc

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)
-prof-use(pass 2) -ipo -xCORE-AVX512 -03 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/je5.0.1-64/lib -ljemalloc

627.cam4_s: basepeak = yes
628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

The flags files that were used to format this result can be browsed at
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-ic19.1u1-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.

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