**SPEC CPU®2017 Floating Point Speed Result**

(Test Sponsor: Netweb Pte Ltd)

**Tyrone Camarero TDI100C3R-212**
(3.00 GHz, Intel Xeon Gold 6354)

**SPECspeed®2017_fp_base = 203**
**SPECspeed®2017_fp_peak = 202**

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (203)</th>
<th>SPECspeed®2017_fp_peak (202)</th>
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<tr>
<td>603.bwaves_s 36</td>
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<tr>
<td>607.cactuBSSN_s 36</td>
<td>236</td>
<td></td>
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<tr>
<td>619.ibm_s 36</td>
<td>175</td>
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<tr>
<td>621.wrf_s 36</td>
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<tr>
<td>627.cam4_s 36</td>
<td>118</td>
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<tr>
<td>628.pop2_s 36</td>
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<td>638.imagick_s 36</td>
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<td>644.nab_s 36</td>
<td>324</td>
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<td>649.fotonik3d_s 36</td>
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<td></td>
</tr>
<tr>
<td>654.roms_s 36</td>
<td>183</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6354
- **Max MHz:** 3600
- **Nominal:** 3000
- **Enabled:** 36 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 Chips
- **Cache L1:** 32 KB I + 48 KB D on chip per core
- **Cache L2:** 1.25 MB I+D on chip per core
- **Cache L3:** 39 MB I+D on chip per chip
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
- **Storage:** 1 x 512 GB NVMe SSD
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux release 8.5 (Ootpa) 4.18.0-348.el8.x86_64
- **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 PEGC0011 released Aug-2022
- **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 and OS set to prefer performance at the cost of additional power usage.
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
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<td>182</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_base** = 203  
**SPECspeed®2017_fp_peak** = 202

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

### 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"
- **MALLOCONF** = "retain:true"
- **OMP_STACKSIZE** = "192M"

### General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4  
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  
runcpu command invoked through numactl i.e.:  

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

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(3.00 GHz, Intel Xeon Gold 6354)

SPECspeed®2017_fp_base = 203
SPECspeed®2017_fp_peak = 202

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

General Notes (Continued)

numactl --interleave=all runcpu <etc>
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.
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.
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Platform Notes

BIOS Settings:
Power Technology = Custom
ENERGY_PERF_BIAS_CFG mode = Extreme Performance
SNC (Sub NUMA) = Enable
KTI Prefetch = Enable
LLC Dead Line Alloc = Disable
Hyper-Threading = Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acfc6d
running on Tyronespec Fri Sep 30 15:08:54 2022

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 6354 CPU @ 3.00GHz
  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 5 6 7 8 9 10 11 12 13 14 15 16 17
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

From 1scpu from util-linux 2.32.1:
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**

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
Tyrone Camarero TDI100C3R-212  
(3.00 GHz, Intel Xeon Gold 6354)

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**SPECspeed®2017_fp_base = 203**

**SPECspeed®2017_fp_peak = 202**

<table>
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<th>006042</th>
<th>Test Date:</th>
<th>Sep-2022</th>
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<tr>
<td>Test Sponsor:</td>
<td>Netweb Pte Ltd</td>
<td>Hardware Availability:</td>
<td>Apr-2021</td>
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<tr>
<td>Tested by:</td>
<td>Tyrone Systems</td>
<td>Software Availability:</td>
<td>May-2022</td>
</tr>
</tbody>
</table>

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**Platform Notes (Continued)**

Thread(s) per core: 2  
Core(s) per socket: 18  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
BIOS Vendor ID: Intel(R) Corporation  
CPU family: 6  
Model: 106  
Model name: Intel(R) Xeon(R) Gold 6354 CPU @ 3.00GHz  
BIOS Model name: Intel(R) Xeon(R) Gold 6354 CPU @ 3.00GHz  
Stepping: 6  
CPU MHz: 3000.000  
CPU max MHz: 3600.0000  
CPU min MHz: 800.0000  
BogoMIPS: 6000.00  
Virtualization: VT-x  
L1d cache: 48K  
L1i cache: 32K  
L2 cache: 1280K  
L3 cache: 39936K  
NUMA node0 CPU(s): 0-17,36-53  
NUMA node1 CPU(s): 18-35,54-71  
Flags: fpu vme de pse tsc msr pae mce 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 pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pni ssbd mbx ibrs ibpb stibp ibrs_enhanced tpr_shadow vmx flexpriority ept vpid ept_ad fsgsbase tsc_adjust sgx bmi1 hle avx2 smep bmi2 ibr m2 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_occphys llc cqm_mbms_total cqm_mbms_local split_lock_detect wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfn vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq 1a57 rdpid sgx_lc fsrmd_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data  
cache size : 39936 KB

From numactl --hardware  
WARNING: a numactl 'node' might or might not correspond to a physical chip.

available: 2 nodes (0-1)  
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53  
node 0 size: 257631 MB  
node 0 free: 232012 MB  

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

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(3.00 GHz, Intel Xeon Gold 6354)

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</tr>
</tbody>
</table>

Platform Notes (Continued)

node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
node 1 size: 258000 MB
node 1 free: 229827 MB
node distances:
node 0 1
  0: 10 20
  1: 20 10

From /proc/meminfo
MemTotal: 528007092 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*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.5 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.5"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.5 (Ootpa)"
    ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos

uname -a:
  Linux Tyronespec 4.18.0-348.el8.x86_64 #1 SMP Mon Oct 4 12:17:22 EDT 2021 x86_64
  x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Purged
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp

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

CVE-2017-5753 (Spectre variant 1):
Mitigation: usercopy/swapgs barriers and __user pointer sanitization

CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

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

CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

**run-level 3 Sep 29 18:44**

SPEC is set to: /home/cpu2017

```
Filesystem  Type Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home  xfs  402G  167G  235G  42%  /home
```

From /sys/devices/virtual/dmi/id
Vendor:     Tyrone Systems
Product:    Tyrone Camarero TDI100C3R-212
Product Family: Family
Serial:     2X22002203

Additional information from dmidecode 3.2 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 M393A4K40DB3-CWE 32 GB 2 rank 3200
14x Samsung M393A4K40EB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor:   American Megatrends International, LLC.
BIOS Version:  PEGC0011
BIOS Date:     08/10/2022
BIOS Revision: 5.22

(End of data from sysinfo program)

**Compiler Version Notes**

```bash
C                     | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
| 644.nab_s(base, peak)
```

Intel(R) oneAPI DPC+/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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**SPECspeed®2017_fp_base = 203**  
**SPECspeed®2017_fp_peak = 202**

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**CPU2017 License:** 006042  
**Test Date:** Sep-2022

**Test Sponsor:** Netweb Pte Ltd  
**Hardware Availability:** Apr-2021

**Tested by:** Tyrone Systems  
**Software Availability:** May-2022

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**Compiler Version Notes (Continued)**

```plaintext
C++, C, Fortran | 607.cactuBSSN_s(base, peak)  

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.

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.
```

---

```plaintext
Fortran | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)  
654.roms_s(base, peak)

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.
```

---

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

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.
```

---

**Base Compiler Invocation**

C benchmarks:  
icx

Fortran benchmarks:  
ifx

Benchmarks using both Fortran and C:  
ifx icx

(Continued on next page)
Tyrone Systems
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SPECspeed®2017_fp_base = 203
SPECspeed®2017_fp_peak = 202

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Base Compiler Invocation (Continued)

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

Base Optimization Flags

C benchmarks:
-m64 -g -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -g -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -Ofast -ffast-math
-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:
-m64 -g -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -g -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto

(Continued on next page)
### Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

### Peak 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`

### 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`: `basepeak = yes`

**Fortran benchmarks:**

- `603.bwaves_s`: `-m64 -g -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -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`

(Continued on next page)
Peak Optimization Flags (Continued)

649.fotonik3d_s: basepeak = yes

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: -m64 -g -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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


You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-ICX-revA.xml