Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero SDI100C2R-28
(2.00 GHz, Intel Xeon Gold 6338)

SPECrate®2017_fp_base = 183
SPECrate®2017_fp_peak = 172

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**Hardware**

**CPU Name:** Intel Xeon Gold 6338  
**Max MHz:** 3200  
**Nominal:** 2000  
**Enabled:** 64 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:** 48 MB I+D on chip per core  
**Memory:** 1 TB (16 x 64 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:** No  
**Firmware:** Version 1.2b released Jun-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.
SPEC CPU®2017 Floating Point Rate Result

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero SD1100C2R-28
(2.00 GHz, Intel Xeon Gold 6338)

SPECrate®2017_fp_base = 183
SPECrate®2017_fp_peak = 172

Results Table

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<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
<td>503.bwaves_r</td>
<td>128</td>
<td>3037</td>
<td>423</td>
<td>1644</td>
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<td>93.4</td>
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<td>862</td>
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<td>508.namd_r</td>
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<td>300</td>
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<td>404</td>
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<td>4805</td>
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<td>10437</td>
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<td>278</td>
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<td>369</td>
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<tr>
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<td>320</td>
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<td>383</td>
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<tr>
<td>549.fotonik3d_r</td>
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<td>27.0</td>
<td>1878</td>
</tr>
</tbody>
</table>

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

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:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOCONF = "retain:true"

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

(Continued on next page)
General Notes (Continued)

runcpu command invoked through numactl i.e.:
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 = Maximum 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 982a61ec0915b55891ef0e16acafec6d
running on icelake3 Sat Sep  3 03:39:37 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 6338 CPU @ 2.00GHz
  2 "physical id"s (chips)
  128 "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 : 32
siblings : 64
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s):  32-bit, 64-bit

(Continued on next page)
<table>
<thead>
<tr>
<th>Spec 2017 Floating Point Rate Result</th>
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<tbody>
<tr>
<td><strong>CPU2017 License</strong>: 006042</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Tested by</strong>: Tyrone Systems</td>
</tr>
<tr>
<td><strong>SPECRate®2017_fp_base</strong> = 183</td>
</tr>
<tr>
<td><strong>SPECRate®2017_fp_peak</strong> = 172</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

- Byte Order: Little Endian
- CPU(s): 128
- On-line CPU(s) list: 0-127
- Thread(s) per core: 2
- Core(s) per socket: 32
- Socket(s): 2
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- BIOS Vendor ID: Intel(R) Corporation
- CPU family: 6
- Model: 106
- Model name: Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHZ
- BIOS Model name: Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHZ
- Stepping: 6
- CPU MHz: 2001.000
- CPU max MHZ: 2001.0000
- CPU min MHZ: 800.0000
- BogoMIPS: 4000.00
- Virtualization: VT-x
- L1d cache: 48K
- L1i cache: 32K
- L2 cache: 1280K
- L3 cache: 49152K
- NUMA node0 CPU(s): 0-15,64-79
- NUMA node1 CPU(s): 16-31,80-95
- NUMA node2 CPU(s): 32-47,96-111
- NUMA node3 CPU(s): 48-63,112-127
- 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 pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
- xtrm pdc cmid cco sse4_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_patin ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vmi flexpriority ept
- vpid ept_ad fsgsbase tsc_adjust sgx bmi1 hle avx2 smep bmi2 ertv cnvpcid cqm rdt_a
- avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
- avx512bw avx512vl vsaveopt xsaves xsaveopt xsave xsaveopt xgetbv1 xsave vcmpxtdq
- avx512_vbmi2 fnri vae vpcm10dq avx512_vnni avx512_vbitlg tme
- avx512_vpopcntdq la57 rdpid sgx_lc fscr md_clear pconfig flush_lidl arch_capabilities

/proc/cpuinfo cache data

cache size: 49152 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)

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

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

Test Date: Sep-2022
Hardware Availability: Apr-2021
Software Availability: May-2022

Platform Notes (Continued)

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 64 65 66 67 68 69 70 71 72 73 74 75
76 77 78 79
node 0 size: 257627 MB
node 0 free: 240036 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88
89 90 91 92 93 94 95
node 1 size: 258040 MB
node 1 free: 245364 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102
103 104 105 106 107 108 109 110 111
node 2 size: 258003 MB
node 2 free: 245532 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117
118 119 120 121 122 123 124 125 126 127
node 3 size: 258038 MB
node 3 free: 245473 MB
node distances:
node 0 1 2 3
0: 10 11 20 20
1: 11 10 20 20
2: 20 20 10 11
3: 20 20 11 10

From /proc/meminfo
MemTotal: 1056471280 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

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

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Software Availability: May-2022

Platform Notes (Continued)

uname -a:
    Linux icelake3 4.18.0-348.el8.x86_64 #1 SMP Mon Oct 4 12:17:22 EDT 2021 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): Not affected
CVE-2018-3639 (Speculative Store Bypass):
    Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):
    Mitigation: usercopy/swapgs barriers and __user pointer sanitation
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 2 11:13

SPEC is set to: /home/cpu2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs 402G 155G 247G 39% /home

From /sys/devices/virtual/dmi/id
    Vendor: Tyrone Systems
    Product: Tyrone Camarero SDI100C2R-28
    Product Family: SMC X12
    Serial: A444717X2418924

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:
    16x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

BIOS:
    BIOS Vendor: American Megatrends International, LLC.
    BIOS Version: 1.2b
    BIOS Date: 06/01/2022
    BIOS Revision: 5.22

(Continued on next page)
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SPECrates®2017_fp_peak = 172
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CPU2017 License: 006042
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Platform Notes (Continued)

(End of data from sysinfo program)

Compiler Version Notes

C

519.lbm_r(base, peak) 538.imagick_r(base, peak)
544.nab_r(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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C++

508.namd_r(base, peak) 510.parest_r(base, peak)

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C++, C

511.povray_r(base, peak) 526.blender_r(base, peak)

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C++, C, Fortran

507.cactuBSSN_r(base, peak)

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(Continued on next page)
SPECFCSR®2017 Floating Point Rate Result

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

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### Compiler Version Notes (Continued)

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<th>503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)</th>
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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### Base Compiler Invocation

C benchmarks:
- icx

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifx

Benchmarks using both Fortran and C:
- ifx icx

Benchmarks using both C and C++:
- icpx icx

Benchmarks using Fortran, C, and C++:
- icpx icx ifx

---

### Base Portability Flags

503.bwaves_r: -DSPEC_LP64

(Continued on next page)
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Base Portability Flags (Continued)

507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

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

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

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

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

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math

(Continued on next page)
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Software Availability: May-2022

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- nostandard-realloc-lhs -align array32byte -auto -ljemalloc
- L/usr/local/jemalloc64-5.0.1/lib

Peak Compiler Invocation

C benchmarks:
icx
C++ benchmarks:
icpx
Fortran benchmarks:
ifx
Benchmarks using both Fortran and C:
ifx icx
Benchmarks using both C and C++:
icpx icx
Benchmarks using Fortran, C, and C++:
icpx icx ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes
544.nab_r: basepeak = yes

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

C++ benchmarks:

508.namd_r:basepeak = yes
510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
           -flto -mfpmath=sse -funroll-loops
           -qopt-mem-layout-trans=4 -ljemalloc
           -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r:basepeak = yes
549.fotonik3d_r:basepeak = yes
554.roms_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
           -flto -mfpmath=sse -funroll-loops
           -qopt-mem-layout-trans=4 -nostandard-realloc-lhs
           -align array32byte -auto -ljemalloc
           -L/usr/local/jemalloc64-5.0.1/lib

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

Benchmarks using both C and C++:

511.povray_r: -w -m64 -std=c11 -Wl,-z,muldefs
              -fprofile-generate(pass 1)
              -fprofile-use=default.profdata(pass 2) -xCORE-AVX2 -Ofast
              -ffast-math -flto -mfpmath=sse -funroll-loops
              -qopt-mem-layout-trans=4 -ljemalloc
              -L/usr/local/jemalloc64-5.0.1/lib
526.blender_r:basepeak = yes

Benchmarks using Fortran, C, and C++:

           -w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
           -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
           -nostandard-realloc-lhs -align array32byte -auto -ljemalloc
           -L/usr/local/jemalloc64-5.0.1/lib
SPEC CPU®2017 Floating Point Rate Result

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero SDI100C2R-28
(2.00 GHz, Intel Xeon Gold 6338)

SPECrate®2017_fp_base = 183
SPECrate®2017_fp_peak = 172

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

Hardware Availability: Apr-2021
Software Availability: May-2022

Test Date: Sep-2022

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

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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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