## SPEC CPU®2017 Floating Point Speed Result

### Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DIT400TR-48RL
(2.30 GHz, Intel Xeon Gold 5218)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_peak</th>
<th>SPECspeed®2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>116</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 006042
**Test Date:** Feb-2020
**Test Sponsor:** Netweb Pte Ltd
**Hardware Availability:** Sep-2019
**Tested by:** Netweb
**Software Availability:** Aug-2019

### Threads

<table>
<thead>
<tr>
<th>Program</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_peak</th>
<th>SPECspeed®2017_fp_base</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>32</td>
<td>127</td>
<td>93.9</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>32</td>
<td>127</td>
<td>127</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>32</td>
<td>87.3</td>
<td>87.4</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>32</td>
<td>108</td>
<td>108</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>32</td>
<td>70.8</td>
<td>70.8</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>64</td>
<td>62.6</td>
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<tr>
<td>638.imagick_s</td>
<td>32</td>
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<tr>
<td>644.nab_s</td>
<td>64</td>
<td>79.9</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>32</td>
<td>94.0</td>
<td>94.0</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>32</td>
<td>144</td>
<td>144</td>
</tr>
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### Software

**OS:** CentOS Linux release 7.7.1908 (Core)
**Compiler:** C/C++: Version 19.0.4.243 of Intel C/C++ Compiler Build 20190416 for Linux;
Fortran: Version 19.0.4.243 of Intel Fortran Compiler Build 20190416 for Linux
**Parallel:** Yes
**File System:** xfs
**System State:** Run level 3 (multi-user)
**Base Pointers:** 64-bit
**Peak Pointers:** 64-bit
**Power Management:** Default

### Hardware

**CPU Name:** Intel Xeon Gold 5218
**Max MHz:** 3900
**Nominal:** 2300
**Enabled:** 32 cores, 2 chips, 2 threads/core
**Orderable:** 1, 2 (chip)s
**Cache L1:** 32 KB I + 32 KB D on chip per core
**L2:** 1 MB I+D on chip per core
**L3:** 22 MB I+D on chip per chip
**Other:** None
**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2667)
**Storage:** 1 x 480 GB SSD
**Other:** None
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Results Table

<table>
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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
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</table>

SPECspeed®2017_fp_base = 116
SPECspeed®2017_fp_peak = 120

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,1,0"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesyste 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.
SPEC CPU®2017 Floating Point Speed Result

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DIT400TR-48RL
(2.30 GHz, Intel Xeon Gold 5218)

SPECsonic®2017_fp_base = 116
SPECsonic®2017_fp_peak = 120

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

Platform Notes
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbb1e646485a0011
running on NODE3 Tue Feb 11 04:59:56 2020

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 5218 CPU @ 2.30GHz
2 "physical id"s (chips)
64 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5218 CPU @ 2.30GHz
Stepping: 7
CPU MHz: 999.932
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15,32-47
NUMA node1 CPU(s): 16-31,48-63
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)
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**SPECspeed®2017_fp_base** = 116
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<td>Netweb Pte Ltd</td>
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<td>Tested by</td>
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</tr>
</tbody>
</table>

**Platform Notes (Continued)**

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 nop1 xtification nonstop_tsc
aperfmpref eagerfpui pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3nowprefetch epb cat_13 cdp_13 intel_pni
intel_pt ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi flexpriority ept
vpid fsqgbase tsc_adjust bm1l hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavec xgetbv1 cqm_llc cqm_occop_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln
pts hwp hwp_act_window hwp_epp hwp_kpg_reg pku ospke avx512_vnni md_clear spec_ctrl
intel_stibp flush_l1d arch_capabilities

/proc/cpuinfo cache data
cache size : 22528 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 32 33 34 35 36 37 38 39 40 41 42 43
44 45 46 47
node 0 size: 195229 MB
node 0 free: 165302 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
57 58 59 60 61 62 63
node 1 size: 196608 MB
node 1 free: 167500 MB
node distances:
node 0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 394860792 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
centos-release: CentOS Linux release 7.7.1908 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.7 (Source)
os-release:
NAME="CentOS Linux"
VERSION="7 (Core)"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="7"
PRETTY_NAME="CentOS Linux 7 (Core)"
ANSI_COLOR="0;31"

(Continued on next page)
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| SPECspeed®2017_fp_base = 116 |
| SPECspeed®2017_fp_peak = 120 |

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Platform Notes (Continued)

CPE_NAME="cpe:/o:centos:centos:7"
redhat-release: CentOS Linux release 7.7.1908 (Core)
system-release: CentOS Linux release 7.7.1908 (Core)
system-release-cpe: cpe:/o:centos:centos:7

uname -a:
    Linux NODE3 3.10.0-1062.el7.x86_64 #1 SMP Wed Aug 7 18:08:02 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full retpoline, IBPB

run-level 3 Feb 9 19:15

SPEC is set to: /home/cpu2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/mapper/centos-home xfs 392G 138G 255G 36% /home

From /sys/devices/virtual/dmi/id
    BIOS: American Megatrends Inc. V8.101 08/02/2019
    Vendor: Tyrone Systems
    Product: DIT400TR-48R
    Serial: empty

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 Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(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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Software Availability: Aug-2019

Compiler Version Notes (Continued)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
icc: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
==============================================================================
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
icpc: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
icc: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
ifort: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.

==============================================================================
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 19.0.4.243 Build 20190416
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Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
| 628.pop2_s(base, peak)
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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

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

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp

Benchmarks using both Fortran and C:

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

Benchmarks using Fortran, C, and C++:
  -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
  -nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
  icc -m64 -std=c11

Fortran benchmarks:
  ifort -m64

Benchmarks using both Fortran and C:
  ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
  icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
  -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:

603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

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

654.roms_s (continued):
-qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/TyroneIT-Platform-Settings-V1-CLX-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/TyroneIT-Platform-Settings-V1-CLX-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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