# SPEC CPU®2017 Integer Speed Result

## Tyrone Systems

(Test Sponsor: Netweb Pte Ltd)

DS400TR-54/R

(2.10 GHz, Intel Xeon Silver 4110)

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**CPU2017 License:** 006042

**Test Sponsor:** Netweb Pte Ltd

**Tested by:** Netweb

**Hardware Availability:** Sep-2019

**Test Date:** Nov-2019

**Software Availability:** Aug-2019

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### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>5.14</td>
<td>5.90</td>
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<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>6.93</td>
<td>7.04</td>
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<td>605.mcf_s</td>
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<td>9.74</td>
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<td>620.omnetpp_s</td>
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<td>4.72</td>
<td>9.89</td>
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<td>623.xalancbmk_s</td>
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<td>9.50</td>
<td>9.46</td>
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<tr>
<td>625.x264_s</td>
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<td>9.46</td>
<td>10.8</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>4.28</td>
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<tr>
<td>641.leela_s</td>
<td>32</td>
<td>3.66</td>
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<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>11.1</td>
<td>12.7</td>
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<tr>
<td>657.xz_s</td>
<td>32</td>
<td>16.6</td>
<td>16.9</td>
</tr>
</tbody>
</table>

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### Hardware

**CPU Name:** Intel Xeon Silver 4110

**Max MHz:** 3000

**Nominal:** 2100

**Enabled:** 16 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:** 11 MB I+D on chip per chip

**Other:** None

**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933P-R, running at 2400)

**Storage:** 1 x 480 GB SSD

**Other:** None

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### Software

**OS:** CentOS Linux release 7.7.1908 (Core) 3.10.0-1062.el7.x86_64

**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

**Firmware:** Version 3.1a released Jun-2019

**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:** None
**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
DS400TR-54/R  
(2.10 GHz, Intel Xeon Silver 4110)  

**SPEC CPU®2017 Integer Speed Result**

**Copyright 2017-2020 Standard Performance Evaluation Corporation**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
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<td>16.9</td>
<td>369</td>
<td>16.8</td>
<td>366</td>
<td>16.9</td>
</tr>
</tbody>
</table>

**Results Table**

**Compiler Notes**

SPEC has learned that this result, which used an evaluation compiler, was submitted contrary to the compiler license terms. Intel has granted a one-time waiver for this result.

**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/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
- 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  
Filesystem page cache synced and cleared with:  
sync; echo 3> /proc/sys/vm/drop_caches

(Continued on next page)
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.

Platform Notes

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed81e646a485a0011
running on NODE3 Mon Nov  4 13:06:11 2019

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) Silver 4110 CPU @ 2.10GHz
  2 "physical id"s (chips)
  32 "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 : 8
  siblings : 16
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4110 CPU @ 2.10GHz

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stepping:</td>
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<tr>
<td>CPU MHz:</td>
<td>800.061</td>
</tr>
<tr>
<td>CPU max MHz:</td>
<td>3000.0000</td>
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<tr>
<td>CPU min MHz:</td>
<td>800.0000</td>
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<tr>
<td>BogoMIPS:</td>
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<td>Virtualization:</td>
<td>VT-x</td>
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<td>L1d cache:</td>
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<tr>
<td>L1i cache:</td>
<td>32K</td>
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<td>L2 cache:</td>
<td>1024K</td>
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<td>L3 cache:</td>
<td>11264K</td>
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<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-7,16-23</td>
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<tr>
<td>NUMA node1 CPU(s):</td>
<td>8-15,24-31</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 aperfmperf eagerfpu 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 fl64 rdrand lahf_lm abm 3nowprefetch epb cat_l3 cdp_l3 intel_pni intel_pt ssbd mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmq mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1 cmq_llc cmq_occup_llc cmq_mbb_total cmq_mbb_local dtherm ida arat pln pts pku ospke md_clear spec_ctrl intel_stibp flush_l1d</td>
</tr>
</tbody>
</table>

```
/proc/cpuinfo cache data
  cache size : 11264 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 16 17 18 19 20 21 22 23
  node 0 size: 195239 MB
  node 0 free: 176020 MB
  node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
  node 1 size: 196608 MB
  node 1 free: 179639 MB
  node distances:
    node 0 1
    0:  10  21
    1:  21  10
```

From /proc/meminfo
```
MemTotal:       394875832 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From /etc/*release* /etc/*version*
Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DS400TR-54/R
(2.10 GHz, Intel Xeon Silver 4110)

SPECspeed®2017_int_base = 7.49
SPECspeed®2017_int_peak = 7.52

Platform Notes (Continued)

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"
   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): Mitigation: PTE Inversion; VMX: conditional
   cache flushes, SMT vulnerable
Microarchitectural Data Sampling: Mitigation: Clear CPU buffers; SMT vulnerable
CVE-2017-5754 (Meltdown): Mitigation: PTI
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
   sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Full retpoline, IBPB

run-level 3 Nov 2 19:04

SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/centos-home xfs 392G 123G 270G 32% /home

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 3.1a 06/11/2019
Vendor: Tyrone Systems
Product: X11DAi-N
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.

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SPEC CPU®2017 Integer Speed Result

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(2.10 GHz, Intel Xeon Silver 4110)

SPECspeed®2017_int_base = 7.49
SPECspeed®2017_int_peak = 7.52

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

Memory:
4x NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

C
600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_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.
icc: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.

C++
620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
631.deepsjeng_s(base, peak) 641.leela_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.

Fortran
648.exchange2_s(base, peak)

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.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64
SPEC CPU®2017 Integer Speed Result

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DS400TR-54/R
(2.10 GHz, Intel Xeon Silver 4110)

SPECspeed®2017_int_base = 7.49
SPECspeed®2017_int_peak = 7.52

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

Test Date: Nov-2019
Hardware Availability: Sep-2019
Software Availability: Aug-2019

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

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

Base Optimization Flags

C benchmarks:
-W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.243/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

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

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SPECspeed®2017_int_base = 7.49
SPECspeed®2017_int_peak = 7.52

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

Peak Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 
-no-prec-div -DSPEC_SUPPRESS_OPENMP -gopenmp 
-DSPEC_OPENMP -fno-strict-overflow 
-L/usr/local/je5.0.1-64/lib -ljemalloc

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 
-no-prec-div -DSPEC_SUPPRESS_OPENMP 
-L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP 
-L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div 
-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP 
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div 
-qopt-mem-layout-trans=4 -gopenmp 
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:

620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4

(Continued on next page)
Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DS400TR-54/R
(2.10 GHz, Intel Xeon Silver 4110)

Peak Optimization Flags (Continued)

620.omnetpp_s (continued):
-DSPEC_SUPPRESS_OPENMP
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.243/linux/compiler/lib/intel64
-lqkmalloc

623.xalancbmk_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.243/linux/compiler/lib/intel64
-lqkmalloc

631.deepsjeng_s: Same as 623.xalancbmk_s

641.leela_s: Same as 623.xalancbmk_s

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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:

SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_base = 7.49
SPECspeed®2017_int_peak = 7.52

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

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Tested with SPEC CPU®2017 v1.1.0 on 2019-11-04 02:36:10-0500.
Report generated on 2020-10-29 14:56:54 by CPU2017 PDF formatter v6255.