SPEC CPU®2017 Integer Speed Result

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DIT400TR-28RL
(2.80 GHz, Intel Xeon Gold 6242)

Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECspeed®2017_int_base = 7.60
SPECspeed®2017_int_peak = 7.77

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

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (7.60)</th>
<th>SPECspeed®2017_int_peak (7.77)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s 64</td>
<td>5.84</td>
<td>7.56</td>
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<tr>
<td>602.gcc_s 64</td>
<td>7.75</td>
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<tr>
<td>605.mcf_s 64</td>
<td>6.05</td>
<td>9.74</td>
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<tr>
<td>620.omnetpp_s 64</td>
<td>6.11</td>
<td>9.09</td>
</tr>
<tr>
<td>623.xalancbmk_s 64</td>
<td>9.04</td>
<td>10.7</td>
</tr>
<tr>
<td>625.x264_s 64</td>
<td>4.09</td>
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<tr>
<td>631.deepsjeng_s 64</td>
<td>4.09</td>
<td>3.41</td>
</tr>
<tr>
<td>641.leela_s 64</td>
<td>3.41</td>
<td>3.41</td>
</tr>
<tr>
<td>648.exchange2_s 64</td>
<td>11.6</td>
<td>11.6</td>
</tr>
<tr>
<td>657.xz_s 64</td>
<td>18.8</td>
<td>19.0</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 6242
Max MHz: 3900
Nominal: 2800
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 core
Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933P-R)
Storage: 1 x 480 GB SSD
Other: None

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
Firmware: Version V8.101 released Aug-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
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>6.05</td>
<td>271</td>
<td>6.03</td>
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<td>266</td>
<td>6.13</td>
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<tr>
<td>657.xz_s</td>
<td>64</td>
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<td>326</td>
<td>19.0</td>
<td>325</td>
<td>19.0</td>
<td>323</td>
</tr>
</tbody>
</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)

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.


### Platform Notes

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed0b1e646a485a0011
running on NODE6 Sun Oct 20 14:48:59 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

From /proc/cpuinfo

- model name : Intel(R) Xeon(R) Gold 6242 CPU @ 2.80GHz
  - 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 6242 CPU @ 2.80GHz

(Continued on next page)
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## Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

**DIT400TR-28RL**

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<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>006042</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Netweb Pte Ltd</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Netweb</td>
</tr>
</tbody>
</table>

### SPECspeed®2017_int_base = 7.60
### SPECspeed®2017_int_peak = 7.77

## Platform Notes (Continued)

| Stepping: | 7          |
| CPU MHz:  | 1200.219   |
| CPU max MHz: | 2800.0000 |
| CPU min MHz: | 1200.0000 |
| BogoMIPS:  | 5600.00    |
| 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 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 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 f16c rdrand lahf_lm abm 3nowprefetch epb cat_i3 cd8_l3 intel_pni intel_pt xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni md_clear spec_ctrl intel_stibp flush_l1d arch_capabilities

```
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: 195228 MB
node 0 free: 167046 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: 170035 MB
node distances:
node 0  1
 0:  10  21
 1:  21  10
```

From /proc/meminfo

```
MemTotal:       394671632 kB
HugePages_Total:  0
```

(Continued on next page)
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Platform Notes (Continued)

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"
      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 NODE6 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 Oct 18 13:26

   SPEC is set to: /home/cpu2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/mapper/centos-home xfs 392G 196G 197G 50% /home

   From /sys/devices/virtual/dmi/id
      BIOS: American Megatrends Inc. V8.101 08/02/2019
      Vendor: Tyrone Systems
      Product: TP12XH-L2I
      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

(Continued on next page)
Platform Notes (Continued)

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       | 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

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Test Date: Oct-2019
Hardware Availability: Sep-2019
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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
-lgkmalloc

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

(Continued on next page)
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**Peak Compiler Invocation (Continued)**

C++ benchmarks:
- icpc -m64

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 -qopenmp -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 -qopenmp -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:

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

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
-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:

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.0 on 2019-10-20 05:18:58-0400.