## SPEC CPU®2017 Integer Speed Result

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  

**SPEC CPU®2017 Integer Speed Result**  

**Tyrone Camarero DS400TOG-424RT2**  
(2.40 GHz, Intel Xeon Gold 6148)

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**Tyrone Camarero DS400TOG-424RT2**  
(2.40 GHz, Intel Xeon Gold 6148)

**SPECspeed®2017_int_base = 10.2**  
**SPECspeed®2017_int_peak = 10.4**

<table>
<thead>
<tr>
<th>Threaded Program</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tr>
<td>perlbench_s</td>
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<tr>
<td>gcc_s</td>
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<td>mcf_s</td>
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<tr>
<td>omnetpp_s</td>
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<td>xalancbmk_s</td>
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<td>x264_s</td>
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<tr>
<td>deepsjeng_s</td>
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<tr>
<td>leela_s</td>
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<tr>
<td>exchange2_s</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xz_s</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

**CPU Name:** Intel Xeon Gold 6148  
**Max MHz:** 3700  
**Nominal:** 2400  
**Enabled:** 40 cores, 2 chips, 2 threads/core  
**Orderable:** 1.2 (chip)  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 27.5 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)  
**Storage:** 1 x 480 GB SATA SSD  
**Other:** None

**Software**

**OS:** CentOS Linux release 8.2.2004 (Core)  
**Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux Build 20200306;  
**Fortran:** Version 19.1.1.217 of Intel Fortran Compiler for Linux Build 20200306;  
**Parallel:** Yes  
**Firmware:** Version 3.3 released Feb-2020  
**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 set to prefer performance at the cost of additional power usage
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SPECspeed®2017_int_base = 10.2
SPECspeed®2017_int_peak = 10.4

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
<td>602.gcc_s</td>
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<tr>
<td>625.x264_s</td>
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<td>22.7</td>
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<td>22.5</td>
<td>273</td>
<td>22.7</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 10.2
SPECspeed®2017_int_peak = 10.4

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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/intel64:/home/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Cascade Lake CPU 4214R + 384GB RAM memory using Centos 8.2 x86_64
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)
**SPEC CPU®2017 Integer Speed Result**

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<tr>
<td>SPECspeed®2017_int_peak</td>
<td>10.4</td>
</tr>
</tbody>
</table>

**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-2017-5754 (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.
- jemalloc, a general purpose malloc implementation built with the Centos 8.2 x86_64, and the system compiler gcc 4.8.5 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

**Platform Notes**

- BIOS Settings:  
  Power Technology = Custom  
  Power Performance Tuning = BIOS Controls EPB  
  ENERGY_PERF_BIAS_CFG mode = Maximum Performance  
  SNC = Enable  
  Stale AtoS = Disable  
  IMC Interleaving = 1-way Interleave  
  Patrol Scrub = Disable

- Sysinfo program /home/cpu2017/bin/sysinfo  
  Rev: r6538 of 2020-09-24 e8664e6d2d7080afeaa89d4b38e2f1c  
  running on localhost.localdomain Tue Feb 16 16:39:46 2021

- 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 6148 CPU @ 2.40GHz  
  2 "physical id"s (chips)  
  80 "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 : 20  
  siblings : 40  
  physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28  
  physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

- From lscpu:  
  Architecture: x86_64  
  CPU op-mode(s): 32-bit, 64-bit  
  Byte Order: Little Endian

(Continued on next page)
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CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Feb-2021
Hardware Availability: Aug-2020
Software Availability: Jun-2020

Platform Notes (Continued)

CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 2
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
Stepping: 4
CPU MHz: 1440.513
CPU max MHz: 3700.0000
CPU min MHz: 1000.0000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-2,5,6,10-12,15,16,40-42,45,46,50-52,55,56
NUMA node1 CPU(s): 3,4,7-9,13,14,17-19,43,44,47-49,53,54,57-59
NUMA node2 CPU(s): 20-22,25,26,30-32,35,36,60-62,65,66,70-72,75,76
NUMA node3 CPU(s): 23,24,27-29,33,34,37-39,63,64,67-69,73,74,77-79
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 pdelgb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aenfmrperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xptr pdcm pclid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single ptl intel_ppin ssbd mba ibrs ibpb tpr_shadow vmmi flexpriority
epet vpid fsgsbase tsc_adjust cmov bmi1 hle avx2 smep bmi2 ibrms invpcid rtm cqm mpx rdtr
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
dtherm ida arat pln pts pkup ospek md_clear flush_lld

/proc/cpuinfo cache data
cache size : 28160 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 5 6 10 11 12 15 16 40 41 42 45 46 50 51 52 55 56
node 0 size: 95325 MB
node 0 free: 81147 MB
node 1 cpus: 3 4 7 8 9 13 14 17 18 19 43 44 47 48 49 53 54 57 58 59
node 1 size: 96763 MB

(Continued on next page)
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<table>
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<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tr>
<td>10.2</td>
<td>10.4</td>
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**Test Sponsor:** Netweb Pte Ltd  
**Tested by:** Tyrone Systems

**Test Date:** Feb-2021  
**Hardware Availability:** Aug-2020  
**Software Availability:** Jun-2020

---

### Platform Notes (Continued)

- **node 1 free:** 83733 MB  
- **node 2 cpus:** 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 75 76  
- **node 2 size:** 96763 MB  
- **node 2 free:** 84436 MB  
- **node 3 cpus:** 23 24 27 28 29 33 34 37 38 39 63 64 67 68 69 73 74 77 78 79  
- **node 3 size:** 96762 MB  
- **node 3 free:** 84524 MB  
- **node distances:**
  
  - node 0: 10 11 21 21  
  - node 1: 11 10 21 21  
  - node 2: 21 21 10 11  
  - node 3: 21 21 11 10

From /proc/meminfo

- **MemTotal:** 394870504 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*

- centos-release: CentOS Linux release 8.2.2004 (Core)  
- centos-release-upstream: Derived from Red Hat Enterprise Linux 8.2 (Source)  
- os-release:
  
  - NAME="CentOS Linux"  
  - VERSION="8 (Core)"  
  - ID="centos"  
  - ID_LIKE="rhel fedora"  
  - VERSION_ID="8"  
  - PLATFORM_ID="platform:el8"  
  - PRETTY_NAME="CentOS Linux 8 (Core)"  
  - ANSI_COLOR="0;31"

- redhat-release: CentOS Linux release 8.2.2004 (Core)  
- system-release: CentOS Linux release 8.2.2004 (Core)  
- system-release-cpe: cpe:/o:centos:centos:8

uname -a:

- Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri May 8 10:59:10 UTC 2020  
- x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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

## Tyrone Systems

(Netweb Pte Ltd)

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### CPU2017 License: 006042

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**Tested by:** Tyrone Systems

**Test Date:** Feb-2021

**Hardware Availability:** Aug-2020

**Software Availability:** Jun-2020

---

### Platform Notes (Continued)

**CVE-2018-12207 (iTLB Multihit):**

KVM: Vulnerable

Mitigation: PTE Inversion

---

**CVE-2018-3620 (L1 Terminal Fault):**

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: usercopy/swapsgs barriers and __user pointer sanitization

---

**CVE-2017-5715 (Spectre variant 2):**

Mitigation: Full generic retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

---

**CVE-2020-0543 (Special Register Buffer Data Sampling):**

No status reported

---

**CVE-2019-1135 (TSX Asynchronous Abort):**

Mitigation: Clear CPU buffers; SMT vulnerable

---

### run-level 3 Feb 15 10:24

---

### SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mappper/ct-home</td>
<td>xfs</td>
<td>392G</td>
<td>143G</td>
<td>250G</td>
<td>37%</td>
<td>/home</td>
</tr>
</tbody>
</table>

---

### From /sys/devices/virtual/dmi/id

- **Vendor:** Tyrone Systems
- **Product:** Tyrone Camarero DS400TOG-424RT2
- **Product Family:** SMC X11
- **Serial:** A309085X0907231

---

### 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 NO DIMM NO DIMM
- 12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2666

### BIOS:

- **BIOS Vendor:** American Megatrends Inc.
- **BIOS Version:** 3.3
- **BIOS Date:** 02/21/2020
- **BIOS Revision:** 5.14

(End of data from sysinfo program)
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Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Compiler Version Notes

==============================================================================
C       | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)  
| 625.x264_s(base, peak) 657.xz_s(base, peak)
==============================================================================
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
C       | 600.perlbench_s(peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, 
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
C       | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)  
| 625.x264_s(base, peak) 657.xz_s(base, peak)
==============================================================================
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)  
| 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
==============================================================================
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
Fortran | 648.exchange2_s(base, peak)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)

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</tbody>
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**Compiler Version Notes (Continued)**

64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

**Base Compiler Invocation**

**C benchmarks:**

icc

**C++ benchmarks:**

icpc

**Fortran benchmarks:**

ifort

**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:**

-m64 -qnextgen -std=c11  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops  
-fuse=ld.gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc

**C++ benchmarks:**

-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse  
-funroll-loops -fuse=ld.gold -qopt-mem-layout-trans=4

(Continued on next page)
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CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-03 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries

Peak Compiler Invocation

C benchmarks:
icc
C++ benchmarks:
icpc
Fortran benchmarks:
ifort

Peak Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64(**) -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

(**) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:

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

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero DS400TOG-424RT2
(2.40 GHz, Intel Xeon Gold 6148)

SPECspeed®2017_int_base = 10.2
SPECspeed®2017_int_peak = 10.4

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

Test Date: Feb-2021
Hardware Availability: Aug-2020
Software Availability: Jun-2020

Peak Optimization Flags (Continued)

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/usr/local/je5.0.1-64/lib -ljemalloc

602.gcc_s: -m64 -qnextgen -std=c11 -fuse-ld=gold
-01,-plugin-opt=-x86-branches-within-32B-boundaries
-01,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revB.xml
### SPEC CPU®2017 Integer Speed Result

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
**Tyrone Camarero DS400TOG-424RT2**  
(2.40 GHz, Intel Xeon Gold 6148)

| SPECspeed®2017_int_base = 10.2 |
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**CPU2017 License:** 006042  
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| Test Date: Feb-2021 |
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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 v1.1.5 on 2021-02-16 06:09:45-0500.  
Report generated on 2021-03-16 15:25:36 by CPU2017 PDF formatter v6255.  
Originally published on 2021-03-16.