SPEC CPU®2017 Integer Speed Result

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

$SPECspeed®2017\_int\_base = 8.21$

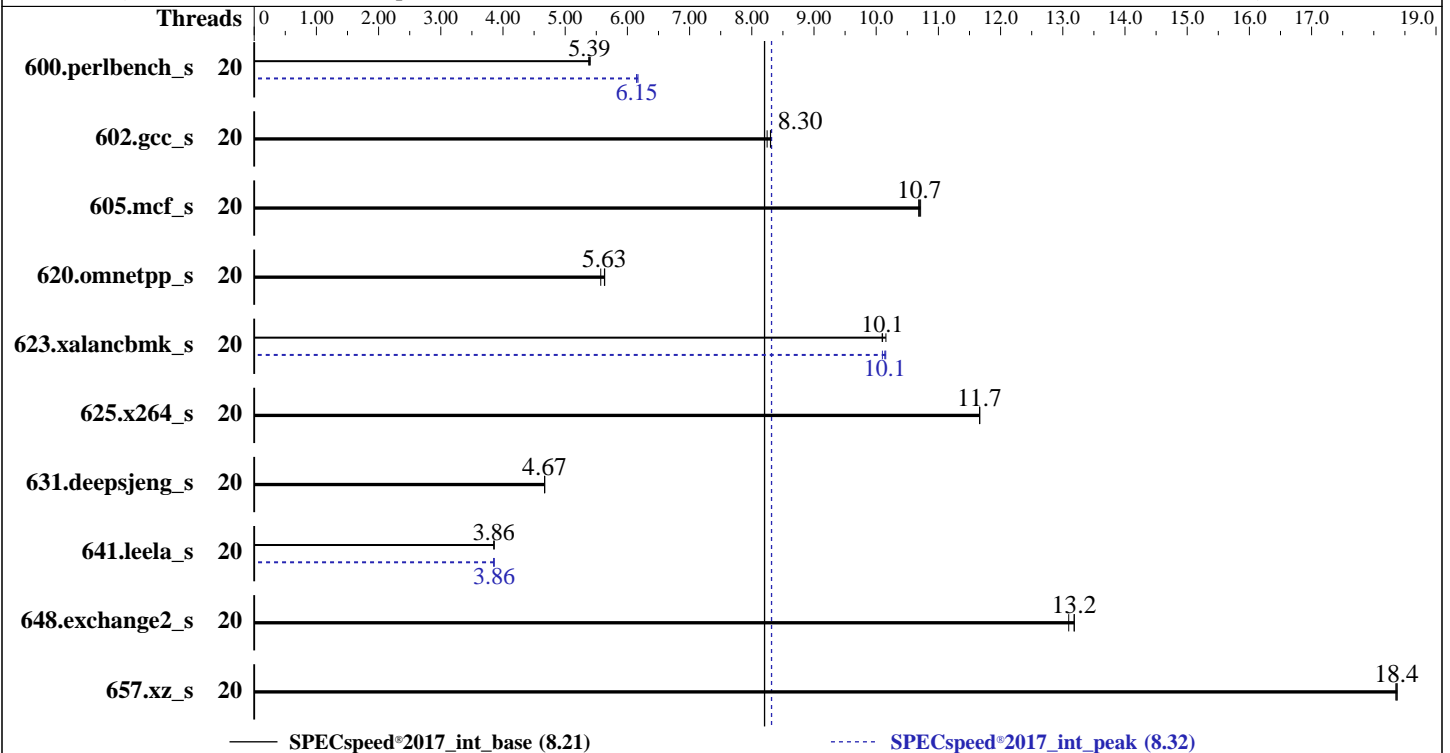$SPECspeed®2017\_int\_peak = 8.32$

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: May-2020

Hardware Availability: Feb-2020

Software Availability: Jun-2019

Threads chart (scale 0 to 19.0):

- 600.perlbench_s 20 — base 5.39, peak 6.15
- 602.gcc_s 20 — 8.30
- 605.mcf_s 20 — 10.7
- 620.omnetpp_s 20 — 5.63
- 623.xalancbmk_s 20 — base 10.1, peak 10.1
- 625.x264_s 20 — 11.7
- 631.deepsjeng_s 20 — 4.67
- 641.leela_s 20 — base 3.86, peak 3.86
- 648.exchange2_s 20 — 13.2
- 657.xz_s 20 — 18.4

SPECspeed®2017_int_base (8.21)   SPECspeed®2017_int_peak (8.32)

Hardware

CPU Name: Intel Xeon Silver 4210R
 Max MHz: 3200
 Nominal: 2400
Enabled: 20 cores, 2 chips
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: 13.75 MB I+D on chip per chip
 Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)
Storage: 1 x 1 TB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP1
Kernel 4.12.14-195-default
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++
Compiler Build 20190416 for Linux;
Fortran: Version 19.0.4.227 of Intel Fortran
Compiler Build 20190416 for Linux
Parallel: Yes
Firmware: Version 6102 released Dec-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc: jemalloc memory allocator library V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: May-2020

Hardware Availability: Feb-2020

Software Availability: Jun-2019

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	20	330	5.38	329	5.40	**329**	**5.39**	20	289	6.15	288	6.17	**289**	**6.15**
602.gcc_s	20	480	8.30	**480**	**8.30**	483	8.25	20	480	8.30	**480**	**8.30**	483	8.25
605.mcf_s	20	441	10.7	**441**	**10.7**	442	10.7	20	441	10.7	**441**	**10.7**	442	10.7
620.omnetpp_s	20	**290**	**5.63**	289	5.64	293	5.57	20	**290**	**5.63**	289	5.64	293	5.57
623.xalancbmk_s	20	140	10.1	140	10.2	**140**	**10.1**	20	140	10.1	140	10.2	**140**	**10.1**
625.x264_s	20	151	11.7	**151**	**11.7**	151	11.7	20	151	11.7	**151**	**11.7**	151	11.7
631.deepsjeng_s	20	307	4.67	307	4.67	**307**	**4.67**	20	307	4.67	307	4.67	**307**	**4.67**
641.leela_s	20	442	3.86	**443**	**3.86**	443	3.85	20	443	3.85	442	3.86	**442**	**3.86**
648.exchange2_s	20	225	13.1	223	13.2	**223**	**13.2**	20	225	13.1	223	13.2	**223**	**13.2**
657.xz_s	20	**337**	**18.4**	337	18.4	336	18.4	20	**337**	**18.4**	337	18.4	336	18.4
SPECspeed®2017_int_base =			**8.21**											
SPECspeed®2017_int_peak =			**8.32**											

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"
OS set to performance mode via cpupower frequency-set -g performance
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/19u4/lib/intel64:/19u4/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
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.

 The jemalloc library was
```

(Continued on next page)

https://www.spec.org/

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

$SPECspeed®2017\_int\_base = 8.21$

$SPECspeed®2017\_int\_peak = 8.32$

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

General Notes (Continued)

```
configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
built with the RedHat Enterprise 7.5,
and the system compiler gcc 4.8.5;
sources available from jemalloc.net or
https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS Configuration:
Patrol Scrub = Disabled
VT-d = Disabled
HyperThreading = Disabled
ENERGY_PERF_BIAS_CFG mode = performance
CSM Support = Disabled
Engine Boost = Level3(Max)
SR-IOV Support = Disabled
LLC dead line allc = Disabled

 Sysinfo program /19u4/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on linux-628j Wed May 13 10:51:07 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) Silver 4210R CPU @ 2.40GHz
       2  "physical id"s (chips)
       20 "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 : 10
       siblings  : 10
       physical 0: cores 0 1 2 3 4 8 9 10 11 12
       physical 1: cores 0 1 2 3 4 8 9 10 11 12

 From lscpu:
    Architecture:        x86_64
    CPU op-mode(s):      32-bit, 64-bit
    Byte Order:          Little Endian
    Address sizes:       46 bits physical, 48 bits virtual
    CPU(s):              20
    On-line CPU(s) list: 0-19
    Thread(s) per core:  1
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Platform Notes (Continued)

```
        Core(s) per socket:   10
        Socket(s):            2
        NUMA node(s):         2
        Vendor ID:            GenuineIntel
        CPU family:           6
        Model:                85
        Model name:           Intel(R) Xeon(R) Silver 4210R CPU @ 2.40GHz
        Stepping:             7
        CPU MHz:              2400.000
        CPU max MHz:          3200.0000
        CPU min MHz:          1000.0000
        BogoMIPS:             4800.00
        Virtualization:       VT-x
        L1d cache:            32K
        L1i cache:            32K
        L2 cache:             1024K
        L3 cache:             14080K
        NUMA node0 CPU(s):    0-9
        NUMA node1 CPU(s):    10-19
        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
    xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
    avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
    invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
    flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
    cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
    avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
    cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
    ospke avx512_vnni md_clear flush_l1d arch_capabilities

 /proc/cpuinfo cache data
    cache size : 14080 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
   node 0 size: 385616 MB
   node 0 free: 384387 MB
   node 1 cpus: 10 11 12 13 14 15 16 17 18 19
   node 1 size: 387039 MB
   node 1 free: 386505 MB
   node distances:
   node   0   1
     0:  10  21
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Platform Notes (Continued)

```
     1:  21  10

 From /proc/meminfo
    MemTotal:         791200240 kB
    HugePages_Total:          0
    Hugepagesize:          2048 kB

 From /etc/*release* /etc/*version*
    os-release:
        NAME="SLES"
        VERSION="15-SP1"
        VERSION_ID="15.1"
        PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
        ID="sles"
        ID_LIKE="suse"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:15:sp1"

 uname -a:
    Linux linux-628j 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
    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: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2):        Mitigation: Enhanced IBRS, IBPB: conditional,
                                           RSB filling

 run-level 3 May 12 18:12

 SPEC is set to: /19u4
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda4       xfs   932G   19G  913G   3% /

 From /sys/devices/virtual/dmi/id
    BIOS:    American Megatrends Inc. 6102 12/19/2019
    Vendor:  ASUSTeK COMPUTER INC.
    Product: Z11PG-D24 Series
    Product Family: Server
    Serial:  System Serial Number

 Additional information from dmidecode follows.  WARNING: Use caution when you interpret
```

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Platform Notes (Continued)

```
  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:
      24x 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

(Continued on next page)

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-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:
```
-Wl,-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:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/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)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

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 -qopenmp`
`-DSPEC_OPENMP -fno-strict-overflow`
`-L/usr/local/je5.0.1-64/lib -ljemalloc`

602.gcc_s: `basepeak = yes`

605.mcf_s: `basepeak = yes`

625.x264_s: `basepeak = yes`

657.xz_s: `basepeak = yes`

C++ benchmarks:

620.omnetpp_s: `basepeak = yes`

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_2019.4.227/linux/compiler/lib/intel64`
`-lqkmalloc`

631.deepsjeng_s: `basepeak = yes`

641.leela_s: `Same as 623.xalancbmk_s`

Fortran benchmarks:

(Continued on next page)

ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(2.40 GHz, Intel Xeon Silver 4210R)

SPECspeed®2017_int_base = 8.21

SPECspeed®2017_int_peak = 8.32

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Peak Optimization Flags (Continued)

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/Intel-ic19.0u1-official-linux64.2019-07-09.html
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z11-V2.0-revH.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z11-V2.0-revH.xml

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 2020-05-12 22:51:07-0400.
Report generated on 2020-07-21 13:15:18 by CPU2017 PDF formatter v6255.
Originally published on 2020-07-21.