SPEC CPU®2017 Integer Speed Result

Dell Inc.
PowerEdge T340 (Intel Xeon E-2236, 3.40 GHz)

**SPECspeed®2017_int_base = 8.23**

**SPECspeed®2017_int_peak = 8.88**

| Test Date: | Dec-2019 |
| Test Sponsor: | Dell Inc. |
| Tested by: | Dell Inc. |
| Hardware Availability: | Dec-2019 |
| Software Availability: | Aug-2019 |

### Threads

<table>
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<th>Benchmark</th>
<th>Threads</th>
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<td>657.xz_s</td>
<td>6</td>
<td>11.1</td>
<td>11.7</td>
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</table>

---

**Hardware**

**CPU Name:** Intel Xeon E-2236  
**Max MHz:** 4800  
**Nominal:** 3400  
**Enabled:** 12 cores, 1 chip  
**Orderable:** 1 chip  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 256 KB I+D on chip per core  
**L3:** 12 MB I+D on chip per chip  
**Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)  
**Storage:** 1 x 960 GB 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 2.1.6 released Nov-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:** BIOS set to prefer performance at the cost of additional power usage.
Dell Inc.

PowerEdge T340 (Intel Xeon E-2236, 3.40 GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

SPEC CPU® 2017 Integer Speed Result

SPECspeed® 2017_int_base = 8.23
SPECspeed® 2017_int_peak = 8.88

Results Table

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</table>

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"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
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.
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
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
SPEC CPU®2017 Integer Speed Result

Dell Inc.

PowerEdge T340 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_int_base = 8.23
SPECspeed®2017_int_peak = 8.88

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<td>Software Availability: Aug-2019</td>
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</tbody>
</table>

Platform Notes

BIOS settings:
Virtualization Technology disabled
DCU Streamer Prefetcher disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
PCI ASPM L1 Link Power Management disabled
Logical Processor disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe16e46a485a0011
running on linux-g3ob Wed Dec 4 15:06:20 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) E-2236 CPU @ 3.40GHz
  1 "physical id"s (chips)
  12 "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 : 6
siblings : 12
physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 39 bits physical, 48 bits virtual
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 2
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2236 CPU @ 3.40GHz
Stepping: 10

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

- **CPU MHz:** 3400.000
- **BogoMIPS:** 6816.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 256K
- **L3 cache:** 12288K
- **NUMA node0 CPU(s):** 0-11
- **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 tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single pti ssbd ibrs ibpbi stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ermi invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsavevs dtherm ida arat pln pts md_clear flush_l1d

/proc/cpuinfo cache data
- **cache size:** 12288 KB

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a physical chip.
- **available:** 1 nodes (0)
- **node 0 cpus:** 0 1 2 3 4 5 6 7 8 9 10 11
- **node 0 size:** 64257 MB
- **node 0 free:** 63449 MB
- **node distances:**
  - node 0
    - 0: 10

From `/proc/meminfo`
- **MemTotal:** 65800056 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"

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

Dell Inc.

PowerEdge T340 (Intel Xeon E-2236, 3.40 GHz)

<table>
<thead>
<tr>
<th>SPEC 2017 int_peak</th>
<th>SPEC 2017 int_base</th>
</tr>
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<tbody>
<tr>
<td>8.88</td>
<td>8.23</td>
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</table>

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Aug-2019

Platform Notes (Continued)

uname -a:

```bash
Linux linux-g3ob 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):
  Mitigation: PTE Inversion
- 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: __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2):
  Mitigation: Indirect Branch Restricted
Speculation, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

run-level 3 Dec 4 15:06 last=5

SPEC is set to: /home/cpu2017

```bash
Filesystem     Type Size  Used Avail Use% Mounted on
/dev/sda2      xfs  440G  36G  405G   9% /
```

From /sys/devices/virtual/dmi/id

- BIOS: Dell Inc. 2.1.6 09/27/2018
- Vendor: Dell Inc.
- Product: PowerEdge T340
- Product Family: PowerEdge

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:

2x 00AD00000A02 HMA82GU7CJR8N-VK 16 GB 2 rank 2666
2x 00AD00000A07 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

(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

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

Dell Inc. PowerEdge T340 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_int_base = 8.23
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Compiler Version Notes (Continued)

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

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
## Dell Inc.

PowerEdge T340 (Intel Xeon E-2236, 3.40 GHz)

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### Base Optimization Flags

**C benchmarks:**

- `-Wl,-z,muldefs`  
- `-xCORE-AVX2`  
- `-ipo`  
- `-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-AVX2`  
- `-ipo`  
- `-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-AVX2`  
- `-ipo`  
- `-no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs`

### Peak Compiler Invocation

**C benchmarks:**

- `icc -m64 -std=c11`

**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-AVX2`  
- `-qopt-mem-layout-trans=4`  
- `-ipo`  
- `-no-prec-div`  
- `-DSPEC_SUPPRESS_OPENMP`  
- `-qopenmp`  
- `-DSPEC_OPENMP`  
- `-fno-strict-overflow`  
- `-L/usr/local/je5.0.1-64/lib`  
- `-ljemalloc`
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**Dell Inc.**

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### SPECspeed®2017_int_base = 8.23

### SPECspeed®2017_int_peak = 8.88

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### Peak Optimization Flags (Continued)

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2  
-xCORE-AVX2 -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-AVX2 -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-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -qopenmp -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-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4  
-DSPEC_SUPPRESS_OPENMP  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

623.xalancbmk_s: -Wl,-z,muldefs -xCORE-AVX2 -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: Same as 623.xalancbmk_s

641.leela_s: Same as 623.xalancbmk_s

Fortran benchmarks:

-xCORE-AVX2 -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


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- **Test Sponsor:** Dell Inc.  
- **Tested by:** Dell Inc.  
- **Test Date:** Dec-2019  
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- **Software Availability:** Aug-2019  

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 2019-12-04 16:06:20-0500.  
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