### Dell Inc.

**PowerEdge FC640 (Intel Xeon Gold 6240M, 2.60GHz)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.75</td>
<td>9.96</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Mar-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

#### Threads

<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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<tbody>
<tr>
<td>perlbench_s</td>
<td></td>
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</tr>
<tr>
<td>gcc_s</td>
<td></td>
<td></td>
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<tr>
<td>mcf_s</td>
<td></td>
<td></td>
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<tr>
<td>omnetpp_s</td>
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<tr>
<td>xalanchmk_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x264_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>leela_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>exchange2_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xz_s</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Gold 6240M  
- **Max MHz.:** 3900  
- **Nominal:** 2600  
- **Enabled:** 36 cores, 2 chips  
- **Orderable:** 1,2 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 24.75 MB I+D on chip per chip  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage:** 1 x 480 GB SATA SSD  
- **Other:** None

#### Software

- **OS:** Ubuntu 18.04.2 LTS  
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux; Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux  
- **Parallel:** Yes  
- **Firmware:** Version 2.2.2 released Mar-2019  
- **File System:** ext4  
- **System State:** Run level 5 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1
SPEC CPU2017 Integer Speed Result

Dell Inc.
PowerEdge FC640 (Intel Xeon Gold 6240M, 2.60GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<tr>
<td>600.perlbench_s</td>
<td>36</td>
<td>268</td>
<td>6.61</td>
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<td>6.64</td>
<td>272</td>
<td>6.53</td>
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<td>6.64</td>
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<td>602.gcc_s</td>
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<td>422</td>
<td>9.43</td>
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<td>9.31</td>
<td>432</td>
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<td>605.mcf_s</td>
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<td>12.1</td>
<td>394</td>
<td>12.0</td>
<td>386</td>
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<td>7.88</td>
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<td>5.49</td>
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<td>641.leela_s</td>
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<td>657.xz_s</td>
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<td>21.1</td>
<td>297</td>
<td>20.8</td>
<td>293</td>
<td>21.1</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base = 9.75
SPECspeed2017_int_peak = 9.96

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
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.
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

(Continued on next page)
**SPEC CPU2017 Integer Speed Result**

**Dell Inc.**

PowerEdge FC640 (Intel Xeon Gold 6240M, 2.60GHz)  

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<td>Hardware Availability: Apr-2019</td>
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**General Notes (Continued)**

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  

**Platform Notes**

BIOS settings:  
ADDDC setting disabled  
Sub NUMA Cluster enabled  
Virtualization Technology disabled  
DCU Streamer Prefetcher enabled  
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  
Logical Processor disabled  
CPU Interconnect Bus Link Power Management disabled  
PCI ASPM L1 Link Power Management disabled  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
runtime on intel-sut Fri May 17 23:57:49 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) Gold 6240M CPU @ 2.60GHz
  2 "physical id"s (chips)
  36 "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 : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 36
On-line CPU(s) list: 0-35
```
**SPEC CPU2017 Integer Speed Result**

**Dell Inc.**

**PowerEdge FC640 (Intel Xeon Gold 6240M, 2.60GHz)**

**SPECspeed2017_int_base = 9.75**

**SPECspeed2017_int_peak = 9.96**

---

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

---

**Platform Notes (Continued)**

Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6240M CPU @ 2.60GHz
Stepping: 7
CPU MHz: 3658.650
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35
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 pclid dca sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand
lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd mba ibrs
ibpb stibp ibrs_enhanced tpr_shadow vmx flexpriority ept vpid fsgsbase tsc_adjust
bmi1 hle avx2 smep bmi2 ets invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed advx
smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec x世家v b1
xsave cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pku
ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data
cache size : 25344 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 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
node 0 size: 191933 MB
node 0 free: 191582 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35
node 1 size: 193510 MB
node 1 free: 192920 MB
node distances:
node   0   1
0:  21  10
1:  10  21

(Continued on next page)
Platform Notes (Continued)

From /proc/meminfo

MemTotal:       394694344 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
Ubuntu 18.04.2 LTS

From /etc/*release* /etc/*version*

debian_version: buster/sid
os-release:
  NAME="Ubuntu"
  VERSION="18.04.2 LTS (Bionic Beaver)"
  ID=ubuntu
  ID_LIKE=debian
  PRETTY_NAME="Ubuntu 18.04.2 LTS"
  VERSION_ID="18.04"
  HOME_URL="https://www.ubuntu.com/"
  SUPPORT_URL="https://help.ubuntu.com/"

uname -a:
  Linux intel-sut 4.15.0-45-generic #48-Ubuntu SMP Tue Jan 29 16:28:13 UTC 2019 x86_64
  x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB

run-level 5 May 17 23:57

SPEC is set to: /home/cpu2017
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda2  ext4  439G 19G 398G  5% /

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.

BIOS Dell Inc. 2.2.2 03/05/2019
Memory:
  3x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
  9x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
  4x Not Specified Not Specified

(End of data from sysinfo program)
Dell Inc.
PowerEdge FC640 (Intel Xeon Gold 6240M, 2.60GHz)

SPEC CPU2017 Integer Speed Result

SPECSpeed2017_int_base = 9.75
SPECSpeed2017_int_peak = 9.96

Copyright 2017-2019 Standard Performance Evaluation Corporation

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CPU2017 License: 55
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Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base, peak) 657.xz_s(base)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC   600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(base) 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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(peak)
==============================================================================
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  648.exchange2_s(base, peak)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

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

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

**Base Optimization Flags**

C benchmarks:
-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:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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
```

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 -qopenmp -DSPEC_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
-ipo -O3 -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 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc
```

(Continued on next page)
### SPEC CPU2017 Integer Speed Result

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**Software Availability:** Feb-2019

---

### Peak Optimization Flags (Continued)

**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 -DSPEC_SUPPRESS_OPENMP -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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`

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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.

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