## Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8260L, 2.40GHz)

| Test Date: | Jul-2019 |
| Test Sponsor: | Dell Inc. |
| Tested by: | Dell Inc. |
| CPU2017 License: | 55 |
| Hardware Availability: | Apr-2019 |
| Software Availability: | May-2019 |

### Threads

<table>
<thead>
<tr>
<th>Test</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>48</td>
<td>7.76</td>
<td>10.3</td>
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<tr>
<td>602.gcc_s</td>
<td>48</td>
<td>9.49</td>
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<td>605.mcf_s</td>
<td>48</td>
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<tr>
<td>620.omnetpp_s</td>
<td>48</td>
<td>6.05</td>
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<td>623.xalancbmk_s</td>
<td>48</td>
<td>12.4</td>
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<tr>
<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
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<tr>
<td>641.leela_s</td>
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<tr>
<td>648.exchange2_s</td>
<td>48</td>
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</tr>
<tr>
<td>657.xz_s</td>
<td>48</td>
<td>21.8</td>
<td></td>
</tr>
</tbody>
</table>

---

### Hardware

- **CPU Name:** Intel Xeon Platinum 8260L
- **Max MHz.:** 3900
- **Nominal:** 2400
- **Enabled:** 48 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:** 35.75 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 19.0.4.227 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 2.2.9 released May-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
## 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>281</td>
<td>22.0</td>
<td>284</td>
<td>21.8</td>
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</tbody>
</table>

SPECspeed2017_int_base = 10.2
SPECspeed2017_int_peak = 10.3

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

## 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.:
umactl --interleave=all runcpu <etc>

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8260L, 2.40GHz)

SPECspeed2017_int_base = 10.2
SPECspeed2017_int_peak = 10.3

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

Test Date: Jul-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

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
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 9bcede8f2999c33d61f64985e45859ea9
running on intel-sut Tue Jul 2 18:28:31 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) Platinum 8260L CPU @ 2.40GHz
 2 "physical id"s (chips)
 48 "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 : 24
siblings : 24
physical 0: cores 0 1 2 3 4 5 6 8 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1

(Continued on next page)
## Dell Inc. PowerEdge M640 (Intel Xeon Platinum 8260L, 2.40GHz)

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<thead>
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### SPECspeed2017_int_base = 10.2

### SPECspeed2017_int_peak = 10.3

### Platform Notes (Continued)

- **Core(s) per socket:** 24
- **Socket(s):** 2
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Platinum 8260L CPU @ 2.40GHz
- **Stepping:** 6
- **CPU MHz:** 3289.843
- **BogoMIPS:** 4800.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 36608K
- **NUMA node0 CPU(s):** 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46
- **NUMA node1 CPU(s):** 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47
- **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 xtrmhz pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebpx cat_l3 cdpr_l3 invpcid_single intel_psl mba ibrs ibp bts ibs Enhanced tpr_shadow vt mvi lpx mset tpi epfd vsxsaub tsc_adjust bmi1 hle avx2 smep bmi2 1rmv invpcid rtm cqm mpx rd_t_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xstorev1 xsaveav xsavec xsaveav icq_msb_total icq_msb_local dtherm ida ar ar pln pts pku ospke avx512_vnni md_clear flush_lid arch_capabilities

```
/proc/cpuinfo cache data
  cache size : 36608 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 36 38 40 42 44 46
  node 0 size: 191892 MB
  node 0 free: 191304 MB
  node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
  node 1 size: 193530 MB
  node 1 free: 193137 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10
```

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

### Dell Inc.

**PowerEdge M640 (Intel Xeon Platinum 8260L, 2.40GHz)**

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### SPECspeed2017 Int Results

- **SPECspeed2017_int_base = 10.2**
- **SPECspeed2017_int_peak = 10.3**

### Platform Notes (Continued)

- **From /proc/meminfo**
  - MemTotal: 394673156 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 4.15.0-50-generic #54-Ubuntu SMP Mon May 6 18:46:08 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 sanitation
  - CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

- **run-level 5 Jul 2 18:24**

- **SPEC is set to:** /home/cpu2017

- **Filesystem**
  - Type Size Used Avail Use% Mounted on
  - /dev/sda2 ext4 439G 34G 384G 8% /

- **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 SMI BIOS" standard.

- **BIOS Dell Inc. 2.2.9 05/08/2019**

- **Memory:**
  - 6x 00AD008300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
  - 1x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
  - 5x 00AD069D00AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933

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SPEC CPU2017 Integer Speed Result

Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8260L, 2.40GHz)

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CPU2017 License: 55
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Test Date: Jul-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

4x Not Specified Not Specified

(End of data from sysinfo program)

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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

(Continued on next page)
**Compiler Version Notes (Continued)**

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**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
```

**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_2019.4.227/linux/compiler/lib/intel64
-lqkmallocl
```

Fortran benchmarks:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
```

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-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 -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 -qopenmp -DSPEC_OPENMP

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

**Dell Inc.**
PowerEdge M640 (Intel Xeon Platinum 8260L, 2.40GHz)

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<tr>
<td>SPECspeed2017_int_peak = 10.3</td>
<td>Hardware Availability: Apr-2019</td>
</tr>
</tbody>
</table>

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

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### Peak Optimization Flags (Continued)

625.x264_s (continued):
- `L/usr/local/je5.0.1-64/lib -ljemalloc`

657.xz_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 -gopenmp`  
- `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-AVX512 -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-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: 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`  
- `nostream-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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