### Dell Inc.

**PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>246</th>
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<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>258</td>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Jul-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Aug-2019

### Hardware

- **CPU Name:** Intel Xeon Gold 6254  
- **Max MHz:** 4000  
- **Nominal:** 3100  
- **Enabled:** 36 cores, 2 chips, 2 threads/core  
- **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 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux  
- **Firmware:** Version 2.2.7 released Apr-2019  
- **File System:** ext4  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** --

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### Table

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**Copies**

- **500.perlbench_r:** 72 copies
- **502.gcc_r:** 72 copies
- **505.mcf_r:** 72 copies
- **520.omnetpp_r:** 72 copies
- **523.xalanchmk_r:** 72 copies
- **525.x264_r:** 72 copies
- **531.deepsjeng_r:** 72 copies
- **541.leela_r:** 72 copies
- **548.exchange2_r:** 72 copies
- **557.xz_r:** 72 copies

---

**Copies (258)**

- **500.perlbench_r:** 219 copies
- **502.gcc_r:** 186 copies
- **505.mcf_r:** 222 copies
- **520.omnetpp_r:** 146 copies
- **523.xalanchmk_r:** 266 copies
- **525.x264_r:** 292 copies
- **531.deepsjeng_r:** 211 copies
- **541.leela_r:** 202 copies
- **548.exchange2_r:** 531 copies
- **557.xz_r:** 517 copies
Dell Inc.
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Results Table

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SPECrate®2017_int_base = 246
SPECrate®2017_int_peak = 258

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.:
### SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)

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<td>Tested by:</td>
<td>Dell Inc.</td>
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#### General Notes (Continued)

numactl --interleave=all runcpu <etc>
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:
ADDCC 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 enabled
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
running on intel-sut Wed Sep 4 01:12:11 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 6254 CPU @ 3.10GHz
- 2 "physical id"s (chips)
- 72 "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: 36
  - 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 lsccpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 72

(Continued on next page)
Spec CPU®2017 Integer Rate Result

Dell Inc. PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)

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CPU2017 License: 55
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Hardware Availability: Apr-2019
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On-line CPU(s) list: 0-71
Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6254 CPU @ 3.10GHz
Stepping: 6
CPU MHz: 3361.197
BogoMIPS: 6200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68
NUMA node1 CPU(s): 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69
NUMA node2 CPU(s): 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70
NUMA node3 CPU(s): 3,7,11,15,19,23,27,31,35,39,43,47,51,55,59,63,67,71

Flags: fpu vme de pse tsc msr pae 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 tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_pstate ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdtd_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512v1 xsaves xsaveopt xsavec xsaveprec qcmpcaps cqm_llc cqm_occpi cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pkup ospke avx512_vnni md_clear flush_l1d arch_capabilities

/platform/cpuinfo cache data

cache size : 25344 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 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68
node 0 size: 95126 MB
node 0 free: 94806 MB
node 1 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69
node 1 size: 96764 MB
node 1 free: 96524 MB
node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70

(Continued on next page)
Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)

SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 246
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CPU2017 License: 55
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Test Date: Jul-2019
Hardware Availability: Apr-2019
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Platform Notes (Continued)

- node 2 size: 96764 MB
- node 2 free: 96575 MB
- node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71
- node 3 size: 96763 MB
- node 3 free: 96263 MB
- node distances:
  - node 0 1 2 3
    - 0: 10 21 11 21
    - 1: 21 10 21 11
    - 2: 11 21 10 21
    - 3: 21 11 21 10

From /proc/meminfo
- MemTotal: 394668432 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 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 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: usercopy/swapgs barriers and __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Sep 3 21:23

SPEC is set to: /home/cpu2017

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

Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)

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**SPECrate®2017_int_base = 246**

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### Platform Notes (Continued)

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<tr>
<td>/dev/sda2</td>
<td>ext4</td>
<td>439G</td>
<td>32G</td>
<td>385G</td>
<td>8%</td>
<td>/</td>
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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. 2.2.7 04/23/2019  
**Memory:**  
- 11x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933  
- 1x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933  
- 12x Not Specified Not Specified

(End of data from sysinfo program)

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### Compiler Version Notes

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<table>
<thead>
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<th>C</th>
<th>502.gcc_r(peak)</th>
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Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

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C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak) |

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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       | 502.gcc_r(peak) |

---

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C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak) |

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**Compiler Version Notes (Continued)**

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==============================================================================
C++ | 523.xalancbmk_r(peak)
==============================================================================

Intel (R) C++ Intel (R) 64 Compiler for applications running on IA-32, Version  
19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.

==============================================================================
C++ | 520.omnettp_r(base, peak) 523.xalancbmk_r(base)  
| 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
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C++ | 523.xalancbmk_r(peak)
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Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.

==============================================================================
Fortran | 548.exchange2_r(base, peak)
==============================================================================

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)  
64, Version 19.0.4.227 Build 20190416  
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SPEC CPU®2017 Integer Rate Result

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PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)

SPECratenew

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SPEC CPU®2017 int_base = 246

CPU2017 License: 55
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Test Date: Jul-2019
Hardware Availability: Apr-2019
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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

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
-lqkmalloc

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
-lqkmalloc

Fortran benchmarks:
-W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

### Peak Compiler Invocation

C benchmarks (except as noted below):
```plaintext
icc -m64 -std=c11

```

C++ benchmarks (except as noted below):
```plaintext
icpc -m64

523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin
```

Fortran benchmarks:
```plaintext
ifort -m64
```

### Peak Portability Flags

- `500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64`
- `502.gcc_r: -D_FILE_OFFSET_BITS=64`
- `505.mcf_r: -DSPEC_LP64`
- `520.omnetpp_r: -DSPEC_LP64`
- `523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX`
- `525.x264_r: -DSPEC_LP64`
- `531.deepsjeng_r: -DSPEC_LP64`
- `541.leela_r: -DSPEC_LP64`
- `545.exchange2_r: -DSPEC_LP64`
- `557.xz_r: -DSPEC_LP64`

### Peak Optimization Flags

C benchmarks:
```plaintext
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
```

(Continued on next page)
### Peak Optimization Flags (Continued)

505.mcf_r (continued):
- \(-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc\)

525.x264_r -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -fno-alias
- \(-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc\)

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
- \(-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc\)

523.xalancbmk_r -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
- \(-L/usr/local/je5.0.1-32/lib -ljemalloc\)

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:


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:

## SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

PowerEdge MX740c (Intel Xeon Gold 6254, 3.10GHz)

<table>
<thead>
<tr>
<th>SPECrate®2017 int_base = 246</th>
<th>SPECrate®2017 int_peak = 258</th>
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<td><strong>Test Date:</strong> Jul-2019</td>
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<tr>
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<td><strong>Hardware Availability:</strong> Apr-2019</td>
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<tr>
<td><strong>Tested by:</strong> Dell Inc.</td>
<td><strong>Software Availability:</strong> Aug-2019</td>
</tr>
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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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