Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)

SPECspeed2017_int_base = 9.89
SPECspeed2017_int_peak = 10.1

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Value</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>6.77</td>
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<tr>
<td>602.gcc_s</td>
<td>7.93</td>
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<tr>
<td>605.mcf_s</td>
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<td>620.omnetpp_s</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>7.76</td>
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<tr>
<td>625.x264_s</td>
<td>7.78</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>12.2</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>12.8</td>
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<tr>
<td>648.exchange2_s</td>
<td>14.6</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 6234
Max MHz.: 4000
Nominal: 3300
Enabled: 16 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
Other: None
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
kernel 4.15.0-46-generic
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 2.2.9 released May-2019
File System: ext4
System State: Run level 3 (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 MX740c (Intel Xeon Gold 6234, 3.30GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
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### CPU2017 License: 55
- **Test Date:** Mar-2019
- **Hardware Availability:** Apr-2019
- **Software Availability:** Mar-2019
- **Test Sponsor:** Dell Inc.
- **Tested by:** Dell Inc.

### Results Table

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<tr>
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<th>Threads</th>
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<th>Ratio</th>
<th>Seconds</th>
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<th>Ratio</th>
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<tr>
<td>600.perlbench_s</td>
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<td>6.77</td>
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<td>625.x264_s</td>
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<td>14.7</td>
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<td>648.exchange2_s</td>
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<td>14.4</td>
<td>204</td>
<td>14.4</td>
<td>204</td>
<td>14.4</td>
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<td>19.4</td>
<td>319</td>
<td>19.4</td>
<td>316</td>
<td>19.5</td>
</tr>
</tbody>
</table>

### 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 MX740c (Intel Xeon Gold 6234, 3.30GHz)

Dell Inc.

Specspeed2017_int_base = 9.89
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Mar-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
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
running on intel-sut Wed May 22 16:15:43 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 6234 CPU @ 3.30GHz
  2 "physical id"s (chips)
  16 "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 : 8
siblings : 8
physical 0: cores 2 3 9 11 24 25 27
physical 1: cores 2 4 9 11 17 25 26 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 16
On-line CPU(s) list: 0-15

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)

| SPECspeed2017_int_base = 9.89 |
| SPECspeed2017_int_peak = 10.1 |

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

Test Date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Mar-2019

Platform Notes (Continued)

Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6234 CPU @ 3.30GHz
Stepping: 7
CPU MHz: 3921.471
BogoMIPS: 6600.00
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
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15
Flags: fpu vme de pse tsc msr pae mce 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 mrsqm aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_pni ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ersed ms motion cdq mpx rdmsk rdt_a avx512f avx512dq rdseed v fanc pti cr4_features smap clflushopt clwb intel_pt avx2abi12 avx1abi12 avxabi12 xsaveopt xsavevc xsaveci xsavec cmov lpae mmx sfs syscall

/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
node 0 size: 191895 MB
node 0 free: 191572 MB
node 1 cpus: 1 3 5 7 9 11 13 15
node 1 size: 193533 MB
node 1 free: 193039 MB
node distances:
node 0 1
0: 10 21
1: 21 10

(Continued on next page)
Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)

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

**Platform Notes (Continued)**

From `/proc/meminfo`
- MemTotal: 394680124 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 4.15.0-46-generic #49-Ubuntu SMP Wed Feb 6 09:33:07 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 3 May 22 16:14

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>ext4</td>
<td>439G</td>
<td>20G</td>
<td>397G</td>
<td>5%</td>
<td>/</td>
</tr>
</tbody>
</table>

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. 2.2.9 05/08/2019
- Memory:
  - 11x 00AD00B300AD HMA84GR7CR4N-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)
## Dell Inc.

**PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)**

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<th>SPECspeed2017_int_base</th>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Mar-2019  
**Hardware Availability:** Apr-2019  
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### Compiler Version Notes

<table>
<thead>
<tr>
<th>Compiler Invocation</th>
<th>Base Compiler Invocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base, peak) 657.xz_s(base)</td>
</tr>
<tr>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018</td>
<td></td>
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<tr>
<td>Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
<td></td>
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<td>CC</td>
<td>600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)</td>
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<tr>
<td>CXXC</td>
<td>620.omnetpp_s(base) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</td>
</tr>
<tr>
<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018</td>
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<td>CXXC</td>
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<td></td>
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<tr>
<td>FC</td>
<td>648.exchange2_s(base, peak)</td>
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<tr>
<td>Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018</td>
<td></td>
</tr>
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**Base Compiler Invocation**

```
C benchmarks:  
icc -m64 -std=c11
```

(Continued on next page)
Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)

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<thead>
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### 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
Dell Inc.  
PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)

| SPECspeed2017_int_base = 9.89 |
| SPECspeed2017_int_peak = 10.1 |

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

**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 -gopenmp -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 -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)
Dell Inc.
PowerEdge MX740c (Intel Xeon Gold 6234, 3.30GHz)

**SPEC CPU2017 Integer Speed Result**

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<td>10.1</td>
</tr>
</tbody>
</table>

**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`

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.

Tested with SPEC CPU2017 v1.0.5 on 2019-05-22 12:15:42-0400.
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