## SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

**PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>305</td>
<td>315</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Feb-2021

### Hardware

- **CPU Name:** Intel Xeon Gold 6354  
- **Max MHz:** 3600  
- **Nominal:** 3000  
- **Enabled:** 36 cores, 2 chips, 2 threads/core  
- **Orderable:** 1.2 chips  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 39 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R)  
- **Storage:** 125 GB on tmpfs  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.2 (Ootpa)  
  4.18.0-193.el8.x86_64  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
  Compiler Build 20201113 for Linux;  
  Fortran: Version 2021.1 of Intel Fortran Compiler  
  Classic Build 20201112 for Linux;  
  C/C++: Version 2021.1 of Intel C/C++ Compiler  
  Classic Build 20201112 for Linux  
- **Parallel:** No  
- **Firmware:** Version 1.1.1 released Apr-2021  
- **File System:** tmpfs  
- **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:** BIOS and OS set to prefer performance at the cost of additional power usage.

### Performance Results

<table>
<thead>
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<tr>
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**Copies (207)**
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

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

SPECrate®2017_int_base = 305
SPECrate®2017_int_peak = 315

Results Table

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</tbody>
</table>

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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

LD_LIBRARY_PATH =
"/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/ia32:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/je5.0.1-32"

Malloc_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1

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)
General Notes (Continued)

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

Benchmark run from a 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

Platform Notes

BIOS Settings:
- Sub NUMA Cluster : 2-Way Clustering
- Virtualization Technology : Disabled

- System Profile : Custom
- CPU Power Management : Maximum Performance
- C1E : Disabled
- C States : Autonomous
- Memory Patrol Scrub : Disabled
- Energy Efficiency Policy : Performance
- CPU Interconnect Bus Link
- Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.7-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Fri Apr 9 03:18:25 2021

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 6354 CPU @ 3.00GHz
  - 2 "physical id"s (chips)
  - 72 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following

(Continued on next page)
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

SPEC CPU®2017 Integer Rate Result

SPECrate®2017_int_base = 305
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Apr-2021
Tested by: Dell Inc.
Hardware Availability: Apr-2021
Software Availability: Feb-2021

Platform Notes (Continued)

excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 18
siblings : 36
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
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: 106
Model name: Intel(R) Xeon(R) Gold 6354 CPU @ 3.00GHz
Stepping: 6
CPU MHz: 3543.369
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 39936K
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): 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70
NUMA node2 CPU(s): 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69
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 mce cmov pat pse36 cli flush dtscache data

(Continued on next page)
## Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

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### Platform Notes (Continued)

```
cache size : 39936 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: 257439 MB
node 0 free: 247849 MB
node 1 cpus:  2  6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70
node 1 size: 258043 MB
node 1 free: 257692 MB
node 2 cpus:  1  5  9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69
node 2 size: 258016 MB
node 2 free: 257800 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: 258041 MB
node 3 free: 257839 MB
node distances:
node 0 1 2 3
0: 10 11 20 20
1: 11 10 20 20
2: 20 20 10 11
3: 20 20 11 10

From /proc/meminfo
MemTotal: 1056297348 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sbin/tuned-adm active
  Current active profile: throughput-performance

From /etc/*release*/etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux"
  VERSION="8.2 (Ootpa)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="8.2"
  PLATFORM_ID="platform:el8"
  PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
  ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
```

(Continued on next page)
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

**SPEC CPU®2017 Integer Rate Result**

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

**Platform Notes (Continued)**

Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020  
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

- CVE-2018-12207 (iTLB Multihit): Not affected
- CVE-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: Not affected
- CVE-2017-5754 (Meltdown): Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
- CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Apr 9 01:16

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1

```
Filesystem     Type   Size  Used Avail Use% Mounted on
tmpfs          tmpfs  125G  4.4G  121G   4% /mnt/ramdisk
```

From /sys/devices/virtual/dmi/id

Vendor: Dell Inc.  
Product: PowerEdge MX750c  
Product Family: PowerEdge  
Serial: 1234567

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:**
- 15x 00AD063200AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
- 17x 00AD063200AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200

**BIOS:**
- BIOS Vendor: Dell Inc.  
- BIOS Version: 1.1.1  
- BIOS Date: 04/02/2021  
- BIOS Revision: 1.1

(End of data from sysinfo program)
Dell Inc.  
PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 305
SPECrate®2017_int_peak = 315

Compiler Version Notes

==============================================================================
C       | 500.perlbench_r(peak) 557.xz_r(peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base)
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Version 2021.1 Build 20201113
(Continued on next page)
### Compiler Version Notes (Continued)

```
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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| C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) | 525.x264_r(base, peak) 557.xz_r(base) |
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|         | Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

---

| C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |
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### Base Compiler Invocation

C benchmarks:
- icx

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tr>
<td>gcc_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>mcf_r</td>
<td>-DSPEC_LP64</td>
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<tr>
<td>xz_r</td>
<td>-DSPEC_LP64</td>
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</tbody>
</table>

### Base Optimization Flags

#### C benchmarks:
- `-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math`
- `-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lgkmalloc`

#### C++ benchmarks:
- `-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lgkmalloc`

#### Fortran benchmarks:
- `-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div`
- `-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte`
- `-auto -mbranches-within-32B-boundaries`

(Continued on next page)
Dell Inc. PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

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

SPECrater®2017_int_base = 305
SPECrater®2017_int_peak = 315

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc

500.perlbench_r: icc
557.xz_r: icc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

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: -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

Peak Optimization Flags

C benchmarks:
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries

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

**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

<table>
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<th>SPECrate®2017_int_peak = 315</th>
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- **CPU2017 License:** 55
- **Test Sponsor:** Dell Inc.
- **Test Date:** Apr-2021
- **Hardware Availability:** Apr-2021
- **Tested by:** Dell Inc.
- **Software Availability:** Feb-2021

### Peak Optimization Flags (Continued)

500.perlbench_r (continued):

- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

502.gcc_r: -m32

- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin`
- `-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass1)
- `fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto`
- `Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4`
- `-mbranches-within-32B-boundaries`
- `-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc`

505.mcf_r: basepeak = yes

525.x264_r: -w

- `-std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto`
- `-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias`
- `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

557.xz_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div

- `-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**C++ benchmarks:**

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

**Fortran benchmarks:**

548.exchange2_r: basepeak = yes

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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:

## SPEC CPU®2017 Integer Rate Result

**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6354, 3.00 GHz)

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| Test Sponsor:    | Dell Inc. |
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