## SPEC CPU®2017 Floating Point Speed Result

### Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6342, 2.80 GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>194</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>198</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Dec-2020

### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
  4.18.0-240.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:** Yes
- **Firmware:** Version 1.1.2 released Apr-2021
- **File System:** tmpfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 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.

### Hardware

- **CPU Name:** Intel Xeon Gold 6342
- **Max MHz:** 3500
- **Nominal:** 2800
- **Enabled:** 48 cores, 2 chips
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 48 KB D on chip per core
- **Cache L2:** 1.25 MB I+D on chip per core
- **Cache L3:** 36 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
- **Storage:** 125 GB on tmpfs
- **Other:** None

### SPECspeed®2017_fp_base

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>241</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>141</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>160</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>167</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>140</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>85.5</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>48</td>
<td>178</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>48</td>
<td>360</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>405</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
<td>233</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_peak:** 198

---

The graph shows the SPECspeed®2017 fp base and peak results for various benchmarks, with threads ranging from 48 to 198 and SPECspeed® values from 30.0 to 600.0.
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>85.9</td>
<td>85.9</td>
<td>687</td>
<td>85.9</td>
<td>687</td>
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<td>687</td>
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</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>69.3</td>
<td>67.8</td>
<td>246</td>
<td>67.8</td>
<td>246</td>
<td>67.8</td>
<td>246</td>
<td>67.8</td>
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<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>37.3</td>
<td>36.7</td>
<td>143</td>
<td>36.7</td>
<td>143</td>
<td>36.7</td>
<td>143</td>
<td>36.7</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>82.2</td>
<td>82.7</td>
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<td>63.4</td>
<td>140</td>
<td>63.4</td>
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<td>48.6</td>
<td>360</td>
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<td>78.4</td>
<td>78.3</td>
<td>116</td>
<td>78.3</td>
<td>116</td>
<td>78.3</td>
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<td>67.5</td>
<td>233</td>
<td>67.5</td>
</tr>
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</table>

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

### 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:
- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM

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

(Continued on next page)
General Notes (Continued)

Filesystem page cache synced and cleared with:
```
sync; echo 3 > /proc/sys/vm/drop_caches
```
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:

Logical Processor : Disabled
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 Tue May  4 06:15:29 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 6342 CPU @ 2.80GHz
  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 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
```

From lscpu:
```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
```
Dell Inc.
PowerEdge MX750c (Intel Xeon Gold 6342, 2.80 GHz)

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

SPECspeed®2017_fp_base = 194
SPECspeed®2017_fp_peak = 198

Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Specbench®2017 Floating Point Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

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Test Date: May-2021
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Platform Notes (Continued)

Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6342 CPU @ 2.80GHz
Stepping: 6
CPU MHz: 801.405
BogoMIPS: 5600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s): 0-23
NUMA node0 CPU(s): 24-47
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
xtrr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
 avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebpx cat_l3 invpcid_single
 intel_pppin ssbd mba ibrs ibpb ibrs_enabled fsbsbase tsc_adjust bmi1 hle axv2
 smep bmi2 erms invpcid cmtd bt_drcmt a2x smap avx51ifma
 c flushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaveopt xsave
 xsaves cqm_llc cqm_occup llc cqm_mdb_total cqm_mdb_local split_lock_detect wbinvd
 dtherm ida arat pln pts avx512vmbmi umip pku ospke avx512_vmbmi2 gfn1 vais
 vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig
 flush_l1d
arch_capabilities

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 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
node 0 size: 494771 MB
node 0 free: 500082 MB
node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 1 size: 494771 MB
node 1 free: 514563 MB

(Continued on next page)
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Platform Notes (Continued)

node distances:
node 0 1
 0: 10 20
 1: 20 10

From /proc/meminfo
MemTotal: 1056291644 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="8.3 (Ootpa)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="8.3"
  PLATFORM_ID="platform:el8"
  PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
  ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
  Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 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): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

(Continued on next page)
Dell Inc. PowerEdge MX750c (Intel Xeon Gold 6342, 2.80 GHz)

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**Platform Notes (Continued)**

run-level 3 May 4 03:31
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 125G 11G 115G 9% /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:
16x 00AD063200AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200
16x Not Specified Not Specified

BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 1.1.2
BIOS Date: 04/09/2021
BIOS Revision: 1.1

(End of data from sysinfo program)

**Compiler Version Notes**

========================================================================================================
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base)
========================================================================================================
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 | 644.nab_s(peak)
========================================================================================================
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6342, 2.80 GHz)

**SPEC**

**PRE**

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**Compiler Version Notes (Continued)**

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**C**

```
| 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base) |
```

---

**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.

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**C**

```
| 644.nab_s(peak) |
```

---

**Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113**

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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**C++, C, Fortran**

```
| 607.cactuBSSN_s(base, peak) |
```

---

**Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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**Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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**Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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**Fortran**

```
| 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak) |
```

---

**Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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---

**Fortran, C**

```
| 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak) |
```

---

**Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000**

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Compiler Version Notes (Continued)

Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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.

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: --DSPEC_LP64
607.cactuBSSN_s: --DSPEC_LP64
619.lbm_s: --DSPEC_LP64
621.wrf_s: --DSPEC_LP64 --DSPEC\_CASE\_FLAG --convert big\_Endian
627.cam4_s: --DSPEC\_LP64 --DSPEC\_CASE\_FLAG
628.pop2_s: --DSPEC\_LP64 --DSPEC\_CASE\_FLAG --convert big\_Endian
--assume byterecl
638.imagick_s: --DSPEC\_LP64
644.nab_s: --DSPEC\_LP64
649.fotonik3d_s: --DSPEC\_LP64
654.roms_s: --DSPEC\_LP64

Base Optimization Flags

C benchmarks:
--m64 --std=c11 --xCORE-AVX512 --ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp --DSPEC\_OPENMP
--mbranches--within-32B-boundaries

(Continued on next page)
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**Base Optimization Flags (Continued)**

Fortran benchmarks:
- `m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3`  
- `no-prec-div -qopt-prefetch -ffinite-math-only`  
- `qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs`  
- `mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib`  
- `ljemalloc`

Benchmarks using both Fortran and C:
- `m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
- `DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `L/usr/local/jemalloc64-5.0.1/lib`  
- `ljemalloc`

Benchmarks using Fortran, C, and C++:
- `m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
- `DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `L/usr/local/jemalloc64-5.0.1/lib`  
- `ljemalloc`

**Peak Compiler Invocation**

C benchmarks (except as noted below):
- `icc`
- `644.nab_s: icx`

Fortran benchmarks:
- `ifort`

Benchmarks using both Fortran and C:
- `ifort icc`

Benchmarks using Fortran, C, and C++:
- `icpc icc ifort`

**Peak Portability Flags**

Same as Base Portability Flags
Dell Inc.  
PowerEdge MX750c (Intel Xeon Gold 6342, 2.80 GHz)  

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<td>Tested by: Dell Inc.</td>
<td>Software Availability: Dec-2020</td>
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</table>

---

**Peak Optimization Flags**

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

644.nab_s: -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -fiopenmp
-DSPEC_OPENMP -gopt-mem-layout-trans=4
-fimf-accuracy-bits=14:sqrt
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: basepeak = yes

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)
-prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div
-gopt-prefetch -ffinite-math-only -gopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

---

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:

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml


**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6342, 2.80 GHz)  

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Tested with SPEC CPU®2017 v1.1.7 on 2021-05-04 06:15:29-0400.  
Originally published on 2021-07-06.