## SPEC CPU®2017 Integer Rate Result

### Inspur Corporation

**Inspur NF5180M6 (Intel Xeon Gold 5320T)**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3358</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Inspur Corporation</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Inspur Corporation</td>
</tr>
</tbody>
</table>

**SPECrater®2017_int_base = 291**

**SPECrater®2017_int_peak = 301**

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 5320T</td>
</tr>
<tr>
<td>Max MHz:</td>
<td>3800</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2300</td>
</tr>
<tr>
<td>Enabled:</td>
<td>40 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1.25 MB I+D on chip per core</td>
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<tr>
<td>L3:</td>
<td>30 MB I+D on chip per chip</td>
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<tr>
<td>Other:</td>
<td>None</td>
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<tr>
<td>Memory:</td>
<td>1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 1.6 TB NVME SSD</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

- **OS:** Red Hat Enterprise Linux release 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;
  C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux;
  Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux
- **Parallel:** No
- **Firmware:** Version 05.00.02 released May-2021
- **File System:** xfs
- **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.

### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECrater®2017_int_base (291)</th>
<th>SPECrater®2017_int_peak (301)</th>
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</thead>
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<tr>
<td>500.perlbench_r</td>
<td>242</td>
<td>231</td>
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<tr>
<td>502.gcc_r</td>
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<tr>
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<td>520.omnetpp_r</td>
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<td>523.xalancbmk_r</td>
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<td>525.x264_r</td>
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<td>557.xz_r</td>
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**Test Date:** Oct-2021

**Hardware Availability:** May-2021

**Software Availability:** Dec-2020

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**Copyright 2017-2021 Standard Performance Evaluation Corporation**

**Inspur Corporation**

**Inspur NF5180M6 (Intel Xeon Gold 5320T)**

**SPECrater®2017_int_base = 291**

**SPECrater®2017_int_peak = 301**

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</tbody>
</table>

---

**CPU Name:** Intel Xeon Gold 5320T

**Max MHz:** 3500

**Nominal:** 2300

**Enabled:** 40 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:** 30 MB I+D on chip per chip

**Other:** None

**Memory:** 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)

**Storage:** 1 x 1.6 TB NVME SSD

**Other:** None
SPEC CPU®2017 Integer Rate Result

Inspur Corporation
Inspur NF5180M6 (Intel Xeon Gold 5320T)

**SPECrate®2017_int_base = 291**

**SPECrate®2017_int_peak = 301**

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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</tr>
</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** = "*/home/CPU2017/lib/intel64:/home/CPU2017/lib/ia32:/home/CPU2017/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

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
```

(Continued on next page)
Inspur Corporation

Inspur NF5180M6 (Intel Xeon Gold 5320T)

SPECrater\textsuperscript{\textregistered}2017\textsubscript{int\_base} = 291
SPECrater\textsuperscript{\textregistered}2017\textsubscript{int\_peak} = 301

CPU2017 License: 3358
Test Sponsor: Inspur Corporation
Tested by: Inspur Corporation

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

General Notes (Continued)

runccpu command invoked through numactl i.e.:
numactl --interleave=all runccpu <etc>

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.

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

Platform Notes

BIOS configuration:
ENERGY\_PERF\_BIAS\_CFG mode set to Performance
Hardware Prefetch set to Disable
VT Support set to Disable
C1E Support set to Disable

Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Mon Oct 25 05:58:08 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 5320T CPU @ 2.30GHz
  2 "physical id"s (chips)
  80 "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 : 20
siblings : 40
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

From lscpu from util-linux 2.32.1:
Architecture: x86\_64
CPU op-mode(s): 32-bit, 64-bit

(Continued on next page)
**Inspecur Corporation**

**Inspecur NF5180M6 (Intel Xeon Gold 5320T)**

**SPEC CPU®2017 Integer Rate Result**

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Test Sponsor</th>
<th>Tested by</th>
<th>Test Date</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
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<tr>
<td>3358</td>
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<td>Oct-2021</td>
<td>May-2021</td>
<td>Dec-2020</td>
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**SPECrate®2017_int_base = 291**

**SPECrate®2017_int_peak = 301**

**Platform Notes (Continued)**

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<th>Little Endian</th>
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<td>Core(s) per socket:</td>
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<td>NUMA node2 CPU(s):</td>
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<td>Flags:</td>
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</tr>
</tbody>
</table>

/proc/cpuinfo cache data

cache size : 30720 KB

From numacl --hardware

WARNING: a numacl 'node' might or might not correspond to a physical chip.

available: 4 nodes (0-3)

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 40 41 42 43 44 45 46 47 48 49

data size: 257636 MB
## Platform Notes (Continued)

| node  | free: 257260 MB | node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59 | node 1 size: 258043 MB | node 1 free: 257782 MB | node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69 | node 2 size: 258043 MB | node 2 free: 257724 MB | node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79 | node 3 size: 258013 MB | node 3 free: 257686 MB |
|-------|----------------|-------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| node 0 distances: | 0: 10 11 20 20 | node 1 distances: | 1: 11 10 20 20 | node 2 distances: | 2: 20 20 10 11 | node 3 distances: | 3: 20 20 11 10 |

From `/proc/meminfo`
- MemTotal: 1056498036 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

/sbin/tuned-adm active
- Current active profile: throughput-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has 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:
- 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:

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

## Insapur Corporation

### Insapur NF5180M6 (Intel Xeon Gold 5320T)

<table>
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<tr>
<th>SPECrate®2017_int_base = 291</th>
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<td>CPU2017 License: 3358</td>
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<td>Hardware Availability: May-2021</td>
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<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

- **CVE-2018-12207 (iTLB Multihit):** Not affected
- **CVE-2018-3620 (L1 Terminal Fault):** Not affected
- **Microarchitectural Data Sampling:** Not affected
- **CVE-2017-5754 (Meltdown):** Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2018-3639 (Speculative Store Bypass):** Mitigation: usercopy/swaps barriers and __user pointer sanitization
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- **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 Oct 25 05:56

SPEC is set to: /home/CPU2017

From /sys/devices/virtual/dmi/id

<table>
<thead>
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<th>Vendor: Insapur</th>
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<tbody>
<tr>
<td>Product: NF5180M6</td>
</tr>
<tr>
<td>Product Family: Family</td>
</tr>
<tr>
<td>Serial: 380827124</td>
</tr>
</tbody>
</table>

Additional information from dmidecode 3.2 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:** 32x Micron 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200, configured at 2933

- **BIOS:**
  - BIOS Vendor: American Megatrends Inc.
  - BIOS Version: 05.00.02
  - BIOS Date: 05/22/2021
  - BIOS Revision: 5.22

(End of data from sysinfo program)
## SPEC CPU®2017 Integer Rate Result

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

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(Continued on next page)
Inspur Corporation

Inspur NF5180M6 (Intel Xeon Gold 5320T)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

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Compiler Version Notes (Continued)

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C       | 500.perlbench_r(peak) 557.xz_r(peak)
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==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak) 541.leela_r(base, 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.

==============================================================================
Fortran | 548.exchange2_r(base, peak)
Intel(R) Fortran 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.
# SPEC CPU®2017 Integer Rate Result

## Inspur Corporation

**Inspur NF5180M6 (Intel Xeon Gold 5320T)**

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**Tested by:** Inspur Corporation  
**Test Date:** Oct-2021  
**Hardware Availability:** May-2021  
**Software Availability:** Dec-2020

## Base Compiler Invocation

C benchmarks:  
```bash
cx
```

C++ benchmarks:  
```bash
cpx
```

Fortran benchmarks:  
```bash
ifort
```

## 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:  
```bash
-w -std=c11 -m64 -Wl,-z,muldeffs -xCORE-AVX512 -O3 -ffast-math  
-f1to -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  
-lqkmalloc
```

C++ benchmarks:  
```bash
-w -m64 -Wl,-z,muldeffs -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  
-lqkmalloc
```

Fortran benchmarks:  
```bash
-w -m64 -Wl,-z,muldeffs -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)
Insper Corporation

Inspur NF5180M6 (Intel Xeon Gold 5320T)

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CPU2017 License: 3358
Test Sponsor: Insper Corporation
Tested by: Insper Corporation

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

**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):
icx

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

### Inspar Corporation

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**Tested by:** Inspar Corporation  
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### 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(pass 1)`  
- `-fprofile-use=default.profdata(pass 2)`  
- `-xCORE-AVX512`  
- `-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`

---

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

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.8 on 2021-10-25 05:58:07-0400.


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