Supermicro
SYS-2029BT-DNC0R
(X11DPT-B, Intel Xeon Gold 6248R)

SPECrater®2017_int_base = 346
SPECrater®2017_int_peak = 360

Intel Xeon Gold 6248R
Max MHz: 4000
Nominal: 3000
Enabled: 48 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: 35.75 MB I+D on chip per chip
Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)
Storage: 1 x 400 GB NVMe SSD
Other: None

Red Hat Enterprise Linux release 8.2 (Ootpa)
4.18.0-193.el8.x86_64

C/C++: Version 19.1.1.217 of Intel C/C++ Build 20200306
Compiler for Linux;
Fortran: Version 19.1.1.217 of Intel Fortran Build 20200306
Compiler for Linux

Parallel: No
Firmware: Version 3.3 released Feb-2020
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 set to prefer performance at the cost of additional power usage
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>548.exchange2_r</td>
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<td>557.xz_r</td>
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</tbody>
</table>

### Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux. The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux.

### 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 = 

MALLOC_CONF = "retain:true"
```
Supermicro
SYS-2029BT-DNC0R
(X11DPT-B , Intel Xeon Gold 6248R)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 346
SPECrate®2017_int_peak = 360

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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>

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 Settings:
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Extreme Performance
SNC = Enable
Stale AtoS = Disable
IMC Interleaving = 1-way Interleave
Patrol Scrub = Disable

Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed6b1e6e46a485a001
running on localhost.localdomain Tue Jun 16 09:41:59 2020

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 6248R CPU @ 3.00GHz
  2 "physical id"s (chips)
  96 "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

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

Copyright 2017-2020 Standard Performance Evaluation Corporation

Supermicro
SYS-2029BT-DNC0R
(X11DPT-B, Intel Xeon Gold 6248R)

SPECrate®2017_int_base = 346
SPECrate®2017_int_peak = 360

CPU2017 License: 001176
Test Date: Jun-2020
Test Sponsor: Supermicro
Hardware Availability: Apr-2020
Tested by: Supermicro
Software Availability: Apr-2020

Platform Notes (Continued)

siblings : 48
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6248R CPU @ 3.00GHz
Stepping: 7
CPU MHz: 3600.039
CPU max MHz: 4000.0000
CPU min MHz: 1200.0000
BogoMIPS: 6000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3,7-9,13-15,19,20,24-51,55-57,61-63,67,68
NUMA node1 CPU(s): 4-6,10-12,16-18,21-23,52-54,58-60,64-66,69-71
NUMA node2 CPU(s): 24-27,31-33,37-39,43,44,72-75,79-81,85-87,91,92
NUMA node3 CPU(s): 28-30,34-36,40-42,45-47,76-78,82-84,88-90,93-95
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
   aperfmpref pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
   pcid dca ssse4_1 ssse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
   rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebp cat_l3 cdp_13 invpcid_single
   intel_pminss ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmm티 flexpriority ept
   vpid fsgsbexpire tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mxp rtm
   dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_lid arch_capabilities

/proc/cpuinfo cache data
   cache size : 36608 KB

(Continued on next page)
Platform Notes (Continued)

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 1 2 3 7 8 9 13 14 15 19 20 48 49 50 51 55 56 57 61 62 63 67 68
   node 0 size: 95345 MB
   node 0 free: 95104 MB
   node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 52 53 54 58 59 60 64 65 66 69 70 71
   node 1 size: 96762 MB
   node 1 free: 96390 MB
   node 2 cpus: 24 25 26 27 31 32 33 37 38 39 43 44 72 73 74 75 79 80 81 85 86 87 91 92
   node 2 size: 96735 MB
   node 2 free: 96551 MB
   node 3 cpus: 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 89 90 93 94 95
   node 3 size: 96762 MB
   node 3 free: 96474 MB
   node distances:
       node   0   1   2   3
   0:  10  11  21  21
   1:  11  10  21  21
   2:  21  21  10  11
   3:  21  21  11  10

From /proc/meminfo
   MemTotal:       394859620 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

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)
### Platform Notes (Continued)

- `itlb_multihit`: KVM: Mitigation: Split huge pages
- CVE-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: Not affected
- CVE-2017-5754 (Melttdown): 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/swapgs barriers and __user pointer sanitation
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- `tsx_async_abort`: Mitigation: Clear CPU buffers; SMT vulnerable

run-level 3 Jun 16 09:31

SPEC is set to: /root/cpu2017

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs   367G  8.5G  359G   3% /
```

From /sys/devices/virtual/dmi/id
- BIOS: American Megatrends Inc. 3.3 02/22/2020
- Vendor: Supermicro
- Product: Super Server
- Serial: 0123456789

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:
- 12x NO DIMM NO DIMM
- 12x SK Hynix HMA84GR7CJR4N-XN 32 GB 2 rank 3200

(End of data from sysinfo program)

Sysinfo incorrectly parsed dmidecode output. Configured memory speed is 2933.

### Compiler Version Notes

```
C      | 502.gcc_r(peak)
```

Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen
Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
Supermicro
SYS-2029BT-DNC0R
(X11DPT-B, Intel Xeon Gold 6248R)

SPECrate®2017_int_base = 346
SPECrate®2017_int_peak = 360

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Jun-2020
Hardware Availability: Apr-2020
Software Availability: Apr-2020

Compiler Version Notes (Continued)

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

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 500.perlbench_r(peak) 557.xz_r(peak)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 502.gcc_r(peak)

Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
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)

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 500.perlbench_r(peak) 557.xz_r(peak)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 502.gcc_r(peak)

Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
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(Continued on next page)
## SPEC CPU®2017 Integer Rate Result

**Supermicro**  
SYS-2029BT-DNC0R  
(X11DPT-B, Intel Xeon Gold 6248R)

**SPECrate®2017_int_base = 346**  
**SPECrate®2017_int_peak = 360**

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<th>CPU2017 License</th>
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<td>Supermicro</td>
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<td>Supermicro</td>
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### Compiler Version Notes (Continued)

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<th>Language</th>
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<td>C</td>
<td>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)</td>
<td>Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1 NextGen Build 20200304</td>
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<tr>
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<td>525.x264_r(base, peak) 557.xz_r(base)</td>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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<tr>
<td>C</td>
<td>500.perlbench_r(peak) 557.xz_r(peak)</td>
<td>Intel(R) C Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306</td>
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<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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<tr>
<td>C++</td>
<td>520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)</td>
<td>Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1 NextGen Build 20200304</td>
</tr>
<tr>
<td></td>
<td>531.deepsjeng_r(base, peak) 541.leela_r(base, peak)</td>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>Fortran</td>
<td>548.exchange2_r(base, peak)</td>
<td>Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

### Base Compiler Invocation

C benchmarks:  
```bash
icc
```

C++ benchmarks:  
```bash
icpc
```

Fortran benchmarks:  
```bash
ifort
```
# SPEC CPU®2017 Integer Rate Result

**Supermicro**

SYS-2029BT-DNC0R  
(X11DPT-B, Intel Xeon Gold 6248R)

<table>
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<tr>
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</tbody>
</table>

**Copyright 2017-2020 Standard Performance Evaluation Corporation**

| CPU2017 License: | 001176 |
| Test Sponsor: | Supermicro |
| Tested by: | Supermicro |

**Test Date:**  Jun-2020  
**Hardware Availability:** Apr-2020  
**Software Availability:** Apr-2020  

**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:**

- m64 -qnextgen -std=c11  
- Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
- xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops  
- fuse-ld=gold -qopt-mem-layout-trans=4  
- L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin -lqkmalloc

**C++ benchmarks:**

- m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
- Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse  
- funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4  
- L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin -lqkmalloc

**Fortran benchmarks:**

- m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -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  
- L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin -lqkmalloc

**Peak Compiler Invocation**

**C benchmarks:**

- icc

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

Supermicro
SYS-2029BT-DNC0R
(X11DPT-B, Intel Xeon Gold 6248R)

SPECrates®2017_int_base = 346
SPECrates®2017_int_peak = 360

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Jun-2020
Tested by: Supermicro
Hardware Availability: Apr-2020
Software Availability: Apr-2020

Peak Compiler Invocation (Continued)

C++ benchmarks:
icpc

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
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/ia32_lin
-std=gnu89
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdatal -xcORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qnextgen -fuse-ld=gold
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib
-ljemalloc

505.mcf_r: basepeak = yes

(Continued on next page)
Supermicro
SYS-2029BT-DNC0R
(X11DPT-B, Intel Xeon Gold 6248R)

SPECrate®2017_int_base = 346
SPECrate®2017_int_peak = 360

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Jun-2020
Hardware Availability: Apr-2020
Software Availability: Apr-2020

Peak Optimization Flags (Continued)

525.x264_r: -m64 -qnextgen -std=c11
-W1,-plugin-opt=-x86-branches-within-32B-boundaries
-W1,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lkmallloc

557.xz_r: -W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lkmallloc

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
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revG.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revG.xml

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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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