**SPEC® CPU2017 Floating Point Rate Result**  
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ASUSTeK Computer Inc.  
ASUS RS300-E10(P11C-C/4L) Server System  
(3.80 GHz, Intel Xeon E-2186G)

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon E-2186G</td>
<td>OS: SUSE Linux Enterprise Server 12 (x86_64) SP3</td>
</tr>
<tr>
<td>Max MHz.: 4700</td>
<td>Kernel 4.4.120-94.17-default</td>
</tr>
<tr>
<td>Nominal: 3800</td>
<td>Compiler: C/C++: Version 19.0.1.144 of Intel C/C++</td>
</tr>
<tr>
<td>Enabled: 6 cores, 1 chip, 2 threads/core</td>
<td>Compiler for Linux;</td>
</tr>
<tr>
<td>Orderable: 1 chip</td>
<td>Fortran: Version 19.0.1.144 of Intel Fortran</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>Compiler for Linux</td>
</tr>
<tr>
<td>L2: 256 KB I+D on chip per core</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>L3: 12 MB I+D on chip per chip</td>
<td>Firmware: Version 0303 released Aug-2018</td>
</tr>
<tr>
<td>Other: None</td>
<td>File System: btrfs</td>
</tr>
<tr>
<td>Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Storage: 1 x 500 GB SATA HDD</td>
<td>Base Pointers: 64-bit</td>
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<tr>
<td>Other: None</td>
<td>Peak Pointers: 64-bit</td>
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<td>Other: None</td>
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**SPECrate2017_fp_base** = 39.1  
**SPECrate2017_fp_peak** = 39.6

<table>
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<tr>
<th>Benchmark</th>
<th>CPU2017 Floating Point Rate Result</th>
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<tr>
<td>503. bwaves_r</td>
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<tr>
<td>507. cactuBSSN_r</td>
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<tr>
<td>508. namd_r</td>
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<td>519. lbm_r</td>
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<td>526. blender_r</td>
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<td>527. cam4_r</td>
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<tr>
<td>538. imagick_r</td>
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<td>544. nab_r</td>
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<td>549. fotonik3d_r</td>
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<tr>
<td>554. rome_r</td>
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**Test Date:** Dec-2018  
**Hardware Availability:** Sep-2018  
**Software Availability:** Oct-2018
## Results Table

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<td>15.0</td>
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</tbody>
</table>

**SPECrate2017_fp_base = 39.1**

**SPECrate2017_fp_peak = 39.6**

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"

### General Notes

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

```
LD_LIBRARY_PATH = "/spec2017_2019u1/lib/ia32/:/spec2017_2019u1/lib/intel64:
/spec2017_2019u1/jeb5.0.1-32:/spec2017_2019u1/jeb5.0.1-64"
```

Binaries compiled on a system with 1x Intel Core i7-6700K CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5

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
```

Yes: 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.
ASUSTeK Computer Inc.  
ASUS RS300-E10(P11C-C/4L) Server System  
(3.80 GHz, Intel Xeon E-2186G)  

| SPECrate2017_fp_base = 39.1 |
| SPECrate2017_fp_peak = 39.6 |

CPU2017 License: 9016  
Test Sponsor: ASUSTeK Computer Inc.  
Tested by: ASUSTeK Computer Inc.  

Test Date: Dec-2018  
Hardware Availability: Sep-2018  
Software Availability: Oct-2018  

General Notes (Continued)

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.

Platform Notes

BIOS Configuration:  
VT-d = Disabled  
Software Guard Extensions (SGX) = Disabled  
AES = Disabled  
Hardware Prefetcher = Disabled  
Adjacent Cache Line Prefetch = Disabled  
Race to Halt (RTH) = Disabled  

Sysinfo program /spec2017_2019u1/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-pmm5 Tue Dec 4 18:48:36 2018

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) E-2186G CPU @ 3.80GHz  
  1 "physical id"s (chips)  
  12 "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 : 6  
    siblings : 12  
    physical 0: cores 0 1 2 3 4 5

From lscpu:

Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 12  
On-line CPU(s) list: 0-11  
Thread(s) per core: 2  
Core(s) per socket: 6  
Socket(s): 1  
NUMA node(s): 1  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 158  
Model name: Intel(R) Xeon(R) E-2186G CPU @ 3.80GHz  
Stepping: 10  
CPU MHz: 4593.875

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

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SPECrate2017_fp_base = 39.1
SPECrate2017_fp_peak = 39.6

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

CPU max MHz: 4700.0000
CPU min MHz: 800.0000
BogoMIPS: 7583.96
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-11
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpctid_single pln pts dtherm hwlp_notify hwlp_act_window hwlp_epp intel_pt rsb_ctxsw spec_ctrl stibp retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 irdq invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1

/platform/cpuintfo cache data
  cache size : 12288 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 1 nodes (0)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11
  node 0 size: 64313 MB
  node 0 free: 52884 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65857264 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 3
    # This file is deprecated and will be removed in a future service pack or release.
    # Please check /etc/os-release for details about this release.
    os-release:
      NAME="SLES"
      VERSION="12-SP3"

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
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SPECrate2017_fp_base = 39.1
SPECrate2017_fp_peak = 39.6

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Platform Notes (Continued)

VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
    Linux linux-pmm5 4.4.120-94.17-default #1 SMP Wed Mar 14 17:23:00 UTC 2018 (cf3a7bb)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Dec 4 11:38

SPEC is set to: /spec2017_2019u1
    Filesystem     Type     Size  Used Avail Use% Mounted on
    /dev/sda2        btrfs  445G  120G  324G  27%  /

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 American Megatrends Inc. 0303 08/07/2018
Memory:
    4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC    519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base, peak)
------------------------------------------------------------------------------
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC    519.lbm_r(peak)
------------------------------------------------------------------------------
icc (ICC) 19.0.1.144 20181018
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(Continued on next page)
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<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>SPECrate2017_fp_peak</td>
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CPU2017 License: 9016  
Test Sponsor: ASUSTeK Computer Inc.  
Test Date: Dec-2018  
Hardware Availability: Sep-2018  
Tested by: ASUSTeK Computer Inc.  
Software Availability: Oct-2018

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**Compiler Version Notes (Continued)**

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<th>Benchmark</th>
<th>Version</th>
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| CXXC 508.namd_r(base) | 510.parest_r(base, peak) | icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved. |
| CXXC 508.namd_r(peak) | icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved. |
| CC 511.povray_r(base) | 526.blender_r(base, peak) | icpc (ICC) 19.0.1.144 20181018  
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icc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved. |
| CC 511.povray_r(peak) | icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
icc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved. |
| FC 507.cactuBSSN_r(base, peak) | icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
icc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
ifort (IFORT) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved. |
| FC 503.bwaves_r(base, peak) | 549.fotonik3d_r(base, peak) 554.roms_r(base) | (Continued on next page) |
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SPECrate2017_fp_base = 39.1
SPECrate2017_fp_peak = 39.6

Compiler Version Notes (Continued)

---
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

FC 554.roms_r(peak)
---
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

CC 521.wrf_r(base) 527.cam4_r(base, peak)
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ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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CC 521.wrf_r(peak)
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ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

(Continued on next page)
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**CPU2017 License:** 9016  
**Test Sponsor:** ASUSTeK Computer Inc.  
**Tested by:** ASUSTeK Computer Inc.

**Test Date:** Dec-2018  
**Hardware Availability:** Sep-2018  
**Software Availability:** Oct-2018

### Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

```bash
icpc -m64 icc -m64 -std=c11 ifort -m64
```

### Base Portability Flags

```bash
503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64
```

### Base Optimization Flags

**C benchmarks:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

**C++ benchmarks:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

**Fortran benchmarks:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

**Benchmarks using both Fortran and C:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

**Benchmarks using both C and C++:**

```bash
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

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SPEC CPU2017 Floating Point Rate Result
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ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
(3.80 GHz, Intel Xeon E-2186G)

SPECrater2017_fp_base = 39.1
SPECrater2017_fp_peak = 39.6

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: Dec-2018
Hardware Availability: Sep-2018
Software Availability: Oct-2018

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -03
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

538.imagick_r: -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

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SPEC CPU2017 Floating Point Rate Result

ASUSTeK Computer Inc.  
ASUS RS300-E10(P11C-C/4L) Server System  
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<th>Test Date: Dec-2018</th>
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<td>Software Availability: Oct-2018</td>
</tr>
</tbody>
</table>

Peak Optimization Flags (Continued)

544.nab_r: Same as 538.imagick_r

C++ benchmarks:

508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -auto  
-nostandard-realloc-lhs

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

521.wrf_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes
SPEC CPU2017 Floating Point Rate Result

ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
(3.80 GHz, Intel Xeon E-2186G)

SPECrate2017_fp_base = 39.1
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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:
http://www.spec.org/cpu2017/flags/Intel-ic19.0-official-linux64.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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