**SPEC CPU®2017 Integer Rate Result**

**ASUSTeK Computer Inc.**

ASUS RS300-E10(P11C-C/4L) Server System
(3.40 GHz, Intel Xeon E-2224)

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**SPECrate®2017_int_base** = 29.0

**SPECrate®2017_int_peak** = 29.8

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**Hardware**

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<td>Storage</td>
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<td>Other</td>
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**Software**

<table>
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<td>Kernel</td>
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<td>Peak Pointers</td>
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<td>Power Management</td>
<td>Prefer performance at the cost of additional power usage</td>
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Test Date: Jan-2020

Hardware Availability: Oct-2019

Software Availability: May-2019
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
(3.40 GHz, Intel Xeon E-2224)

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SPECrate®2017_int_peak = 29.8

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SPECrate®2017_int_base = 29.0
SPECrate®2017_int_peak = 29.8

Results Table

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<td>15.5</td>
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</table>

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

Submit Notes
The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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"
OS set to performance mode via cpupower frequency-set -g performance

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/spec2017_110/lib/intel64:/spec2017_110/lib/ia32:/spec2017_110/je5.0.1-32"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7900X 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

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

**ASUSTeK Computer Inc.**  
ASUS RS300-E10(P11C-C/4L) Server System  
(3.40 GHz, Intel Xeon E-2224)  

**SPECrate®2017_int_base = 29.0**  
**SPECrate®2017_int_peak = 29.8**

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<td>ASUSTeK Computer Inc.</td>
<td>Software Availability:</td>
<td>May-2019</td>
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</table>

#### General Notes (Continued)

jemalloc: configured and built at default for  
32bit (i686) and 64bit (x86_64) targets;  
jemalloc: built with the RedHat Enterprise 7.4,  
and the system compiler gcc 4.8.5;  
jemalloc: sources available from jemalloc.net or  
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.  
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  
Race to Halt (RTH) = Disabled  
AES = Disabled

Sysinfo program /spec2017_110/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edbla6e46a485a0011  
running on linux-zeo2 Fri Jan 10 07:23:43 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) E-2224 CPU @ 3.40GHz  
    1 "physical id"s (chips)  
    4 "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 : 4  
siblings : 4  
physical 0: cores 0 1 2 3

From lscpu:  
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 4  
On-line CPU(s) list: 0-3  
Thread(s) per core: 1  
Core(s) per socket: 4

(Continued on next page)
## Platform Notes (Continued)

- **Socket(s):** 1
- **NUMA node(s):** 1
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 158
- **Model name:** Intel(R) Xeon(R) E-2224 CPU @ 3.40GHz
- **Stepping:** 10
- **CPU MHz:** 3400.000
- **CPU max MHz:** 4600.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 6816.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 256K
- **L3 cache:** 8192K
- **NUMA node0 CPU(s):** 0-3
- **Flags:** fpu vme de pse tsc msr pae mca 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 cpuid aperfmperf tsc_known_freq 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 cpuid_fault epb invpcid_single pti ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp md_clear flush_l1d

/proc/cpuinfo cache data

```
cache size : 8192 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 1 nodes (0)
nodel cpus: 0 1 2 3
node 0 size: 64046 MB
node 0 free: 62728 MB
node distances:
  node 0
    0: 10
```

From /proc/meminfo

```
MemTotal: 65583688 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

From /etc/*release*/etc/*version* (Continued on next page)
## Platform Notes (Continued)

```
os-release:
    NAME="SLES"
    VERSION="15"
    VERSION_ID="15"
    PRETTY_NAME="SUSE Linux Enterprise Server 15"
    ID="sles"
    ID_LIKE="suse"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15"

uname -a:
    Linux linux-zeo2 4.12.14-150.17-default #1 SMP Thu May 2 15:15:46 UTC 2019 (bf13fb8)
x86_64 x86_64 x86_64 GNU/Linux
```

**Kernel self-reported vulnerability status:**

- **CVE-2018-3620 (L1 Terminal Fault):**
  - Mitigation: PTE Inversion; VMX: conditional cache flushes, SMT disabled
- **Microarchitectural Data Sampling:**
  - Mitigation: Clear CPU buffers; SMT disabled
- **CVE-2017-5754 (Meltdown):**
  - Mitigation: PTI
- **CVE-2018-3639 (Speculative Store Bypass):**
  - Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2017-5753 (Spectre variant 1):**
  - Mitigation: __user pointer sanitization
- **CVE-2017-5715 (Spectre variant 2):**
  - Mitigation: Full generic retpoline, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling

```
runtime 3 Jan 9 20:03
SPEC is set to: /spec2017_110
    /dev/sda4   xfs  929G  27G  903G  3% /
```

From /sys/devices/virtual/dmi/id
- **BIOS:** American Megatrends Inc. 3102 10/04/2019
- **Vendor:** ASUSTeK COMPUTER INC.
- **Product:** P11C-C Series
- **Product Family:** Server
- **Serial:** System Serial Number

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:**
  - 4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 2666
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(3.40 GHz, Intel Xeon E-2224)

SPECrate®2017_int_base = 29.0
SPECrate®2017_int_peak = 29.8

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

Platform Notes (Continued)
(End of data from sysinfo program)

Compiler Version Notes

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<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
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<th>500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)</th>
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<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416</td>
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(Continued on next page)
Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64
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(3.40 GHz, Intel Xeon E-2224)

CPU2017 License: 9016  Test Date: Jan-2020
Tested by: ASUSTeK Computer Inc.  Software Availability: May-2019

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:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11


C++ benchmarks (except as noted below):
icpc -m64

(Continued on next page)
### Peak Compiler Invocation (Continued)

523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin

Fortran benchmarks:

```plaintext
ifort -m64
```

### 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**: `-D_FILE_OFFSET_BITS=64 -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) -ipo`  
  `-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4`  
  `-fno-strict-overflow`  
  `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc`

- **502.gcc_r**: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
  `-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4`  
  `-L/usr/local/je5.0.1-32/lib -ljemalloc`

- **505.mcf_r**: `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
  `-qopt-mem-layout-trans=4`  
  `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc`

- **525.x264_r**: `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
  `-qopt-mem-layout-trans=4 -fno-alias`  
  `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc`

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ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
(3.40 GHz, Intel Xeon E-2224)

SPECrate®2017_int_base = 29.0
SPECrate®2017_int_peak = 29.8

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

Test Date: Jan-2020
Hardware Availability: Oct-2019
Software Availability: May-2019

Peak Optimization Flags (Continued)

557.xz_r: Same as 505.mcf_r

C++ benchmarks:
520.omnetpp_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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:

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