ASUSTeK Computer Inc.
ASUS RS100-E10(P11C-M/4L) Server System
(3.30 GHz, Intel Xeon E-2124)

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

Test Date: Jul-2019
Hardware Availability: Jun-2019
Software Availability: May-2019

<table>
<thead>
<tr>
<th>Software</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: SUSE Linux Enterprise Server 15</td>
<td>Compiler: C/C++: Version 19.0.4.227 of Intel C/C++</td>
</tr>
<tr>
<td>Kernel 4.12.14-150.17-default</td>
<td>Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran</td>
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<tr>
<td></td>
<td>Compiler Build 20190416 for Linux</td>
</tr>
<tr>
<td>Parallel: Yes</td>
<td>Firmware: Version 0703 released Jun-2019</td>
</tr>
<tr>
<td></td>
<td>File System: xfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td></td>
<td>Peak Pointers: 64-bit</td>
</tr>
<tr>
<td></td>
<td>Other: None</td>
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</tbody>
</table>

---

Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s 4</td>
<td>82.4</td>
<td>83.0</td>
</tr>
<tr>
<td>607.cactuBSSN_s 4</td>
<td>38.4</td>
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<tr>
<td>619.lbm_s 4</td>
<td>16.5</td>
<td>16.5</td>
</tr>
<tr>
<td>621.wrf_s 4</td>
<td>30.7</td>
<td>33.0</td>
</tr>
<tr>
<td>627.cam4_s 4</td>
<td>18.0</td>
<td>18.0</td>
</tr>
<tr>
<td>628.pop2_s 4</td>
<td>34.5</td>
<td>34.5</td>
</tr>
<tr>
<td>638.imagick_s 4</td>
<td>18.7</td>
<td>18.7</td>
</tr>
<tr>
<td>644.nab_s 4</td>
<td>15.7</td>
<td>15.7</td>
</tr>
<tr>
<td>649.fotonik3d_s 4</td>
<td>18.0</td>
<td>18.0</td>
</tr>
<tr>
<td>654.roms_s 4</td>
<td>15.7</td>
<td>15.7</td>
</tr>
</tbody>
</table>

---

CPU Name: Intel Xeon E-2124
Max MHz.: 4300
Nominal: 3300
Enabled: 4 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 256 KB I+D on chip per core
L3: 8 MB I+D on chip per chip
Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
Storage: 1 x 500 GB SATA HDD, 7200RPM
Other: None
## SPEC CPU2017 Floating Point Speed Result

ASUSTeK Computer Inc.  
ASUS RS100-E10(P11C-M/4L) Server System  
(3.30 GHz, Intel Xeon E-2124)  

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<tr>
<td>619.lbm_s</td>
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<td>16.5</td>
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<td>30.5</td>
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<td>627.cam4_s</td>
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<td>628.pop2_s</td>
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<td>30.8</td>
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<tr>
<td>638.imagick_s</td>
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<td>771</td>
<td>18.7</td>
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<tr>
<td>644.nab_s</td>
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<td>654.roms_s</td>
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<td>1001</td>
<td>15.7</td>
<td>1001</td>
<td>15.7</td>
<td>1001</td>
<td>15.7</td>
</tr>
</tbody>
</table>

### 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:

- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/spec2017_19u4/lib/intel64"
- OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-799X 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.

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
  - AES = Disabled

(Continued on next page)
ASUSTeK Computer Inc.

ASUS RS100-E10(P11C-M/4L) Server System
(3.30 GHz, Intel Xeon E-2124)

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

SPECspeed2017_fp_base = 26.3
SPECspeed2017_fp_peak = 26.7

Test Date: Jul-2019
Hardware Availability: Jun-2019
Software Availability: May-2019

Platform Notes (Continued)

Sysinfo program /spec2017_19u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-ngvl Fri Jul 12 13:04:27 2019

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-2124 CPU @ 3.30GHz
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
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz
Stepping: 10
CPU MHz: 3300.000
CPU max MHz: 4300.0000
CPU min MHz: 800.0000
BogoMIPS: 6624.00
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 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 tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3

(Continued on next page)
## SPEC CPU2017 Floating Point Speed Result

**ASUSTeK Computer Inc.**  
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**SPECspeed2017_fp_base** = 26.3

**SPECspeed2017_fp_peak** = 26.7

**Platform Notes (Continued)**

sdbg fma cx16 xtpr pdcm pcid ssse4_1 ssse4_2 x2apic movbe popcnt tsc_deadline_timer xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb invpcid_single pti ssbd ibrs ibpb stibp tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_ept flush_lld

/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)
- node 0 cpus: 0 1 2 3
- node 0 size: 64323 MB
- node 0 free: 55445 MB
- node distances:
  - node 0
  - 0: 10

From /proc/meminfo

- MemTotal: 65866792 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*

- 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-ngvl 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-2017-5754 (Meltdown): Mitigation: PTI
- 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

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS100-E10(P11C-M/4L) Server System
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SPECspeed2017_fp_base = 26.3
SPECspeed2017_fp_peak = 26.7

run-level 3 Jul 11 15:15
SPEC is set to: /spec2017_19u4

Platform Notes (Continued)

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. 0703 06/13/2019
Memory:
4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 2666

Compiler Version Notes

CC  619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
---------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
---------------------------
FC  607.cactuBSSN_s(base, peak)
---------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
---------------------------
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)
---------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
ASUSTeK Computer Inc.
ASUS RS100-E10(P11C-M/4L) Server System
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SPECspeed2017_fp_base = 26.3
SPECspeed2017_fp_peak = 26.7

Compiler Version Notes (Continued)

==============================================================================
FC   603.bwaves_s(peak) 649.fotonik3d_s(peak)
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
CC   621.wrf_s(peak) 628.pop2_s(peak)
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

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

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
SPEC CPU2017 Floating Point Speed Result

ASUSTeK Computer Inc.  SPECspeed2017_fp_base = 26.3
ASUS RS100-E10(P11C-M/4L) Server System  SPECspeed2017_fp_peak = 26.7
(3.30 GHz, Intel Xeon E-2124)

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</table>

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:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
   -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
   -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
   -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
   -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
   -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

(Continued on next page)
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| SPECspeed2017_fp_base = 26.3 |
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CPU2017 License: 9016  
Test Sponsor: ASUSTeK Computer Inc.  
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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort -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:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:

603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

627.cam4_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

628.pop2_s: Same as 621.wrf_s

(Continued on next page)
### SPEC CPU2017 Floating Point Speed Result

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---

### Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

- `xCORE-AVX2`  
- `-ipo`  
- `-o3`  
- `-no-prec-div`  
- `-qopt-prefetch`  
- `-ffinite-math-only`

- `-qopt-mem-layout-trans=4`  
- `-qopenmp`  
- `-DSPEC_OPENMP`

- `-nostandard-realloc-lhs`

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