## SPEC® CPU2017 Floating Point Speed Result

**ASUSTeK Computer Inc.**

ASUS RS720Q-E9(Z11PH-D12) Server System  
(3.00 GHz, Intel Xeon Gold 6136)

**SPECspeed2017_fp_base = 108**  
**SPECspeed2017_fp_peak = 109**

### Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base (108)</th>
<th>SPECspeed2017_fp_peak (109)</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>24</td>
<td>127</td>
<td>479</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>24</td>
<td>129</td>
<td>478</td>
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<tr>
<td>619.lbm_s</td>
<td>24</td>
<td>99</td>
<td>102</td>
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<tr>
<td>621.wrf_s</td>
<td>24</td>
<td>65</td>
<td>76</td>
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<tr>
<td>627.cam4_s</td>
<td>24</td>
<td>44.5</td>
<td>44.4</td>
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<tr>
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<td>92.4</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
<td>24</td>
<td>82.7</td>
<td>81.1</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>64.1</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>24</td>
<td>117</td>
<td>121</td>
</tr>
</tbody>
</table>

### Software

**OS:** SUSE Linux Enterprise Server 12 (x86_64) SP3  
**Kernel:** 4.4.120-94.17-default

**Compiler:** C/C++: Version 18.0.3.222 of Intel C/C++  
**Compiler for Linux:** Fortran: Version 18.0.3.222 of Intel Fortran

**Parallel:** Yes  
**Firmware:** Version 0905 released Mar-2018  
**File System:** btrfs

**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** None

---

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

**Test Date:** Jul-2018  
**Hardware Availability:** Mar-2018  
**Software Availability:** Mar-2018

---

**CPU Name:** Intel Xeon Gold 6136  
**Max MHz.:** 3700  
**Nominal:** 3000  
**Enabled:** 24 cores, 2 chips  
**Orderable:** 1, 2 chip(s)  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 24.75 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)  
**Storage:** 1 x 240 GB SATA SSD  
**Other:** None
ASUSTeK Computer Inc.
ASUS RS720Q-E9(Z11PH-D12) Server System
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SPECspeed2017_fp_base = 108
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Results Table

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<tr>
<th>Benchmark</th>
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<th>Ratio</th>
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</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"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
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:
SNC = Disabled
IMC interleaving = AUTO

(Continued on next page)
Platform Notes (Continued)

Patrol Scrub = Disabled
VT-d = Disabled
HyperThreading = Disabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-pmm5 Thu Jul 19 16:30:32 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) Gold 6136 CPU @ 3.00GHz
  2 "physical id"s (chips)
  24 "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 : 12
siblings : 12
physical 0: cores 0 1 2 3 4 9 10 16 18 19 25 26
physical 1: cores 0 1 2 3 4 9 10 16 18 19 25 26

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6136 CPU @ 3.00GHz
Stepping: 4
CPU MHz: 3001.000
CPU max MHz: 3001.0000
CPU min MHz: 1200.0000
BogoMIPS: 6180.25
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-11
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Copyright 2017-2019 Standard Performance Evaluation Corporation

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

Test Date: Jul-2018
Hardware Availability: Mar-2018
Software Availability: Mar-2018

Platform Notes (Continued)

NUMA node1 CPU(s):     12-23
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
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtrm pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm intel_pt rsb_ctxsw spec_ctrl stibp retpoline kaiser tpr_shadow vmmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

/proc/cpuinfo cache data
  cache size: 25344 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
    available: 2 nodes (0-1)
      node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11
      node 0 size: 192067 MB
      node 0 free: 189684 MB
      node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
      node 1 size: 193517 MB
      node 1 free: 188080 MB
      node distances:
        node   0   1
      0:  10  21
      1:  21  10

From /proc/meminfo
  MemTotal:       394838984 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"
    VERSION_ID="12.3"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
    ID="sles"

(Continued on next page)
Platform Notes (Continued)

```plaintext
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 Jul 19 11:36

SPEC is set to: /spec2017
    Filesystem  Type  Size  Used  Avail  Use%  Mounted on
    /dev/sda2    btrfs  203G  99G  103G  49%  /

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. 0905 03/19/2018
    Memory:
    12x Kingston D4-26662R4-32G 32 GB 2 rank 2666

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
==============================================================================
 icc (ICC) 18.0.3 20180410
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

 CC  619.lbm_s(peak)
==============================================================================
 icc (ICC) 18.0.3 20180410
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

(Continued on next page)
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Compiler Version Notes (Continued)

FC 607.cactuBSSN_s(base)

icpc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 607.cactuBSSN_s(peak)

icpc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

ifort (IFORT) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)

ifort (IFORT) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC 621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)

ifort (IFORT) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.3 20180410
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CC 621.wrf_s(peak) 628.pop2_s(peak)

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Compiler Version Notes (Continued)

ifort (IFORT) 18.0.3 20180410
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icc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 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

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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

(Continued on next page)
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Base Optimization Flags (Continued)

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Peak 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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp

(Continued on next page)
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### Peak Optimization Flags (Continued)

619.lbm_s (continued):

- DSPEC_OPENMP

638.imagick_s:
- -xCORE-AVX512
- -ipo
- -O3
- -no-prec-div
- -gopt-prefetch
- -ffinite-math-only
- -gopt-mem-layout-trans=3
- -qopenmp
- -DSPEC_OPENMP

644.nab_s: Same as 638.imagick_s

**Fortran benchmarks:**

- -prof-gen(pass 1), -prof-use(pass 2), -DSPEC_SUPPRESS_OPENMP
- -DSPEC_OPENMP
- -O2
- -xCORE-AVX512
- -gopt-prefetch
- -ipo
- -O3
- -ffinite-math-only
- -no-prec-div
- -gopt-mem-layout-trans=3
- -qopenmp
- -nstandard-realloc-lhs
- -align array32byte

**Benchmarks using both Fortran and C:**

621.wrf_s:
- -prof-gen(pass 1)
- -prof-use(pass 2)
- -O2
- -xCORE-AVX512
- -gopt-prefetch
- -ipo
- -O3
- -ffinite-math-only
- -no-prec-div
- -gopt-mem-layout-trans=3
- -DSPEC_SUPPRESS_OPENMP
- -qopenmp
- -DSPEC_OPENMP
- -nstandard-realloc-lhs
- -align array32byte

627.cam4_s:
- -xCORE-AVX512
- -ipo
- -O3
- -ffinite-math-only
- -no-prec-div
- -gopt-prefetch
- -gopt-mem-layout-trans=3
- -qopenmp
- -DSPEC_OPENMP
- -nstandard-realloc-lhs
- -align array32byte

628.pop2_s: Same as 621.wrf_s

**Benchmarks using Fortran, C, and C++:**

- -prof-gen(pass 1)
- -prof-use(pass 2)
- -O2
- -xCORE-AVX512
- -gopt-prefetch
- -ipo
- -O3
- -ffinite-math-only
- -no-prec-div
- -gopt-mem-layout-trans=3
- -DSPEC_SUPPRESS_OPENMP
- -qopenmp
- -DSPEC_OPENMP
- -nstandard-realloc-lhs
- -align array32byte

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.

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