



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

**ASUSTeK Computer Inc.**  
ASUS RS720-E10-RS12(Z12PP-D32) Server System  
(2.20 GHz, Intel Xeon Platinum 8352Y)

SPECspeed®2017\_fp\_base = 251  
SPECspeed®2017\_fp\_peak = 251

CPU2017 License: 9016

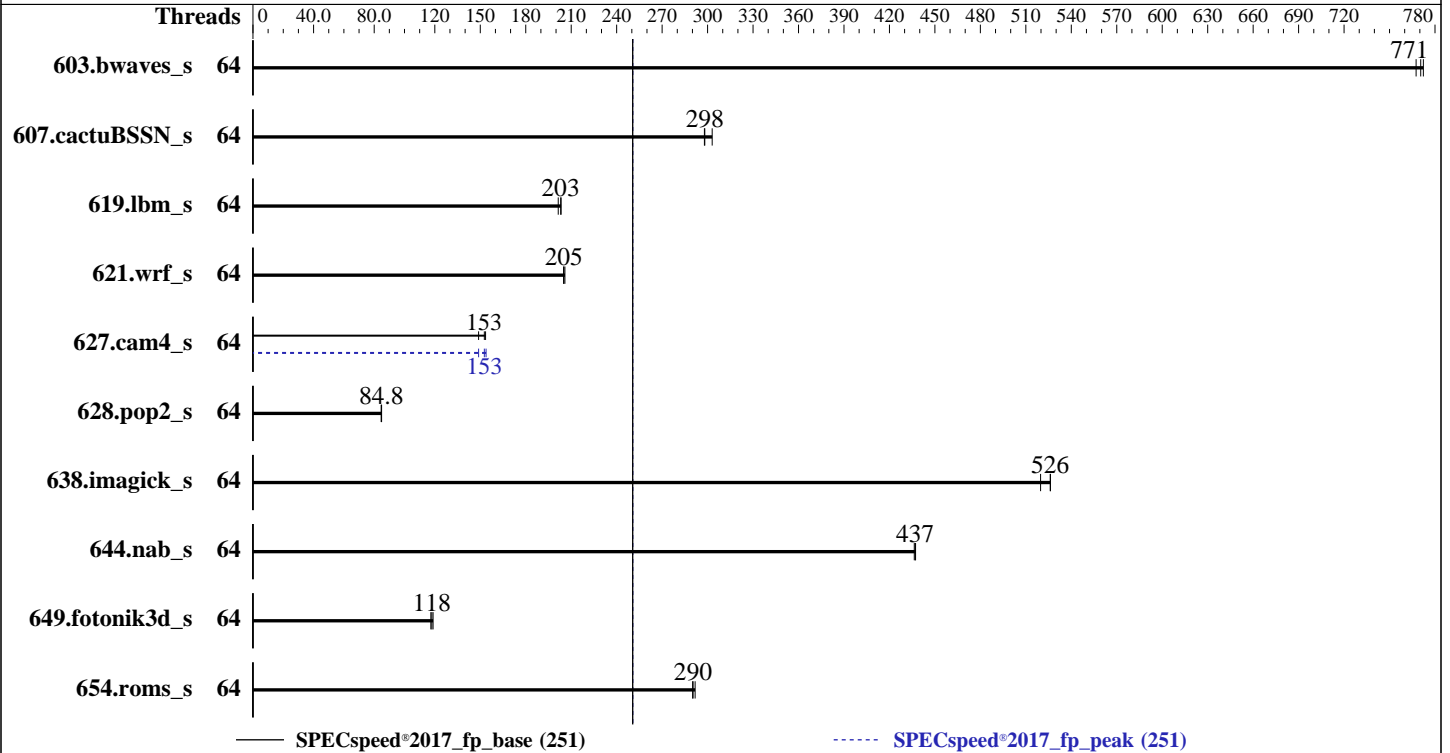
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Feb-2023

Hardware Availability: Apr-2022

Software Availability: May-2022



### Hardware

CPU Name: Intel Xeon Platinum 8352Y  
 Max MHz: 3400  
 Nominal: 2200  
 Enabled: 64 cores, 2 chips  
 Orderable: 1, 2 chip(s)  
 Cache L1: 32 KB I + 48 KB D on chip per core  
 L2: 1.25 MB I+D on chip per core  
 L3: 48 MB I+D on chip per chip  
 Other: None  
 Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)  
 Storage: 1 x 1 TB SATA SSD  
 Other: None

### Software

OS: Red Hat Enterprise Linux release 8.4 (Ootpa) 4.18.0-305.25.1.el8\_4.x86\_64  
 Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;  
 Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;  
 Parallel: Yes  
 Firmware: Version 0802 released Apr-2022  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc memory allocator V5.0.1  
 Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.



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## Results Table

| Benchmark       | Base    |             |            |             |            |             |             | Peak    |             |            |             |            |             |             |
|-----------------|---------|-------------|------------|-------------|------------|-------------|-------------|---------|-------------|------------|-------------|------------|-------------|-------------|
|                 | Threads | Seconds     | Ratio      | Seconds     | Ratio      | Seconds     | Ratio       | Threads | Seconds     | Ratio      | Seconds     | Ratio      | Seconds     | Ratio       |
| 603.bwaves_s    | 64      | <b>76.6</b> | <b>771</b> | 76.4        | 772        | 76.9        | 768         | 64      | <b>76.6</b> | <b>771</b> | 76.4        | 772        | 76.9        | 768         |
| 607.cactuBSSN_s | 64      | <b>55.9</b> | <b>298</b> | 56.0        | 298        | 55.0        | 303         | 64      | <b>55.9</b> | <b>298</b> | 56.0        | 298        | 55.0        | 303         |
| 619.lbm_s       | 64      | 25.8        | 203        | <b>25.8</b> | <b>203</b> | 26.0        | 201         | 64      | 25.8        | 203        | <b>25.8</b> | <b>203</b> | 26.0        | 201         |
| 621.wrf_s       | 64      | 64.5        | 205        | 64.3        | 206        | <b>64.5</b> | <b>205</b>  | 64      | 64.5        | 205        | 64.3        | 206        | <b>64.5</b> | <b>205</b>  |
| 627.cam4_s      | 64      | <b>58.1</b> | <b>153</b> | 59.5        | 149        | 57.7        | 153         | 64      | <b>58.1</b> | <b>153</b> | 57.6        | 154        | 59.5        | 149         |
| 628.pop2_s      | 64      | 140         | 84.6       | 140         | 84.9       | <b>140</b>  | <b>84.8</b> | 64      | 140         | 84.6       | 140         | 84.9       | <b>140</b>  | <b>84.8</b> |
| 638.imagick_s   | 64      | 27.8        | 520        | 27.4        | 526        | <b>27.4</b> | <b>526</b>  | 64      | 27.8        | 520        | 27.4        | 526        | <b>27.4</b> | <b>526</b>  |
| 644.nab_s       | 64      | 40.0        | 436        | 40.0        | 437        | <b>40.0</b> | <b>437</b>  | 64      | 40.0        | 436        | 40.0        | 437        | <b>40.0</b> | <b>437</b>  |
| 649.fotonik3d_s | 64      | <b>77.2</b> | <b>118</b> | 77.7        | 117        | 76.7        | 119         | 64      | <b>77.2</b> | <b>118</b> | 77.7        | 117        | 76.7        | 119         |
| 654.roms_s      | 64      | <b>54.2</b> | <b>290</b> | 54.3        | 290        | 54.0        | 292         | 64      | <b>54.2</b> | <b>290</b> | 54.3        | 290        | 54.0        | 292         |

SPECSpeed®2017\_fp\_base = **251**

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

## 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:  
KMP\_AFFINITY = "granularity=fine,compact"  
LD\_LIBRARY\_PATH = "/home/ic22ul/lib/intel64:/home/ic22ul/je5.0.1-64"  
MALLOCONF = "retain:true"  
OMP\_STACKSIZE = "192M"

## General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB 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  
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

(Continued on next page)



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## General Notes (Continued)

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

## Platform Notes

BIOS Configuration:  
VT-d = Disabled  
Patrol Scrub = Disabled  
Hyper-Threading = Disable  
Engine Boost = Aggressive  
SR-IOV Support = Disabled  
BMC Configuration:  
Fan mode = Full speed mode

```
Sysinfo program /home/ic22ul/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Wed Feb 1 13:09:49 2023
```

SUT (System Under Test) info as seen by some common utilities.

-----  
Table of contents  
-----

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 239 (239-45.el8\_4.3)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent\_hugepage
18. /sys/kernel/mm/transparent\_hugepage/khugepaged
19. OS release
20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode

(Continued on next page)



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### Platform Notes (Continued)

24. BIOS

1. `uname -a`

```
Linux localhost.localdomain 4.18.0-305.25.1.el8_4.x86_64 #1 SMP Mon Oct 18 14:34:11 EDT 2021 x86_64 x86_64
x86_64 GNU/Linux
```

2. `w`

```
13:09:49 up 3:52, 1 user, load average: 5.22, 5.61, 3.36
USER      TTY      FROM          LOGIN@      IDLE        JCPU        PCPU WHAT
root      tty1     -             09:18       3:50m      1.05s      0.00s /bin/bash ./speed.sh
```

3. Username

```
From environment variable $USER: root
```

4. `ulimit -a`

```
core file size          (blocks, -c) 0
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 4126698
max locked memory       (kbytes, -l) 64
max memory size         (kbytes, -m) unlimited
open files              (-n) 1024
pipe size               (512 bytes, -p) 8
POSIX message queues    (bytes, -q) 819200
real-time priority      (-r) 0
stack size              (kbytes, -s) unlimited
cpu time                (seconds, -t) unlimited
max user processes     (-u) 4126698
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
```

5. `sysinfo process ancestry`

```
/usr/lib/systemd/systemd --switched-root --system --deserialize 17
login -- root
-bash
/bin/bash ./speed.sh
/bin/bash ./speed.sh
runcpu --nobuild --action validate --define default-platform-flags -c
ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=64 --tune base,peak -o all --define drop_caches
fpspeed
```

(Continued on next page)



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## Platform Notes (Continued)

```
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2022.1-lin-core-avx512-speed-20220316.cfg --define cores=64 --tune base,peak --output_format all
--define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv
--note-preenv --logfile $SPEC/tmp/CPU2017.307/templogs/preenv.fpspeed.307.0.log --lognum 307.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/ic22ul
```

```
-----
6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) Platinum 8352Y CPU @ 2.20GHz
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 106
   stepping        : 6
   microcode       : 0xd000331
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
   cpu cores       : 32
   siblings        : 32
   2 physical ids (chips)
   64 processors (hardware threads)
   physical id 0: core ids 0-31
   physical id 1: core ids 0-31
   physical id 0: apicids
   0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62
   physical id 1: apicids
   128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
   80,182,184,186,188,190
```

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

### 7. lscpu

```
From lscpu from util-linux 2.32.1:
Architecture:      x86_64
CPU op-mode(s):   32-bit, 64-bit
Byte Order:       Little Endian
CPU(s):           64
On-line CPU(s) list: 0-63
Thread(s) per core: 1
Core(s) per socket: 32
Socket(s):        2
NUMA node(s):    2
Vendor ID:        GenuineIntel
BIOS Vendor ID:  Intel
CPU family:       6
```

(Continued on next page)



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## Platform Notes (Continued)

Model: 106  
Model name: Intel(R) Xeon(R) Platinum 8352Y CPU @ 2.20GHz  
BIOS Model name: Intel(R) Xeon(R) Platinum 8352Y CPU @ 2.20GHz  
Stepping: 6  
CPU MHz: 801.310  
CPU max MHz: 3400.0000  
CPU min MHz: 800.0000  
BogoMIPS: 4400.00  
Virtualization: VT-x  
L1d cache: 48K  
L1i cache: 32K  
L2 cache: 1280K  
L3 cache: 49152K  
NUMA node0 CPU(s): 0-31  
NUMA node1 CPU(s): 32-63

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 pni  
pclmulqdq dtes64 monitor ds\_cpl vmx smx est tm2 sse3 sdbg fma cx16 xtpr pdcm pcid dca  
sse4\_1 sse4\_2 x2apic movbe popcnt tsc\_deadline\_timer aes xsave avx f16c rdrand lahf\_lm  
abm 3dnowprefetch cpuid\_fault epb cat\_l3 invpcid\_single intel\_ppin ssbd mba ibrs ibpb  
stibp ibrs\_enhanced tpr\_shadow vnmi flexpriority ept vpid ept\_ad fsgsbase tsc\_adjust  
bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt\_a avx512f avx512dq rdseed adx smap  
avx512ifma clflushopt clwb intel\_pt avx512cd sha\_ni avx512bw avx512vl xsaveopt xsavec  
xgetbv1 xsaves cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local split\_lock\_detect  
wbnoinvd dtherm ida arat pln pts hwp hwp\_act\_window hwp\_epp hwp\_pkg\_req avx512vbmi  
umip pku ospke avx512\_vbmi2 gfni vaes vpclmulqdq avx512\_vnni avx512\_bitalg tme  
avx512\_vpopcntdq la57 rdpid fsrm md\_clear pconfig flush\_l1d arch\_capabilities

-----  
8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```
available: 2 nodes (0-1)
node 0 cpus: 0-31
node 0 size: 515628 MB
node 0 free: 509294 MB
node 1 cpus: 32-63
node 1 size: 516086 MB
node 1 free: 513746 MB
node distances:
node  0  1
  0:  10  20
  1:  20  10
```

-----  
9. /proc/meminfo

MemTotal: 1056475564 kB

(Continued on next page)



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## Platform Notes (Continued)

-----  
10. who -r  
run-level 3 Feb 1 09:18  
-----

11. Systemd service manager version: systemd 239 (239-45.el8\_4.3)  
Default Target Status  
multi-user running  
-----

12. Services, from systemctl list-unit-files  
STATE UNIT FILES  
enabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online atd auditd autovt@ chronyd  
crond firewalld getty@ import-state insights-client-boot irqbalance iscsi iscsi-onboot kdump  
libstoragemgmt lm\_sensors loadmodules lvm2-monitor mcelog mdmonitor microcode multipathd  
nvme-fc-boot-connections pmcd pmie pmlogger rhsmcertd rsyslog selinux-autorelabel-mark smartd sshd  
sssd syslog sysstat timedatex tuned udisks2 vdo  
disabled arp-ethers blk-availability chrony-wait console-getty cpupower debug-shell ebttables fancontrol  
grafana-server iprdump iprinit iprupdate ipsec iscsid iscsiui kpatch kvm\_stat ledmon nftables  
nis-domainname nvme-autoconnect oddjobd pmfind pmie\_check pmlogger\_check pmlogger\_daily\_report  
pmlogger\_daily\_report-poll pmproxy podman-auto-update postfix powertop psacct ras-mc-ctl  
rasdaemon rdisc rhcd rhsm rhsm-facts rrdcached saslauthd serial-getty@ sshd-keygen@  
systemd-resolved tcscd  
indirect sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo  
masked systemd-timedated  
-----

13. Linux kernel boot-time arguments, from /proc/cmdline  
BOOT\_IMAGE=(hd0,gpt2)/vmlinuz-4.18.0-305.25.1.el8\_4.x86\_64  
root=/dev/mapper/rhel-root  
ro  
resume=/dev/mapper/rhel-swap  
rd.lvm.lv=rhel/root  
rd.lvm.lv=rhel/swap  
rhgb  
quiet  
-----

14. cpupower frequency-info  
analyzing CPU 0:  
current policy: frequency should be within 800 MHz and 3.40 GHz.  
The governor "performance" may decide which speed to use  
within this range.  
boost state support:  
Supported: yes  
Active: yes  
-----

(Continued on next page)



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## Platform Notes (Continued)

-----  
15. tuned-adm active  
Current active profile: throughput-performance  
-----

16. sysctl

|                              |       |
|------------------------------|-------|
| kernel.numa_balancing        | 1     |
| kernel.randomize_va_space    | 2     |
| vm.compaction_proactiveness  | 0     |
| vm.dirty_background_bytes    | 0     |
| vm.dirty_background_ratio    | 10    |
| vm.dirty_bytes               | 0     |
| vm.dirty_expire_centisecs    | 3000  |
| vm.dirty_ratio               | 40    |
| vm.dirty_writeback_centisecs | 500   |
| vm.dirtytime_expire_seconds  | 43200 |
| vm.extfrag_threshold         | 500   |
| vm.min_unmapped_ratio        | 1     |
| vm.nr_hugepages              | 0     |
| vm.nr_hugepages_mempolicy    | 0     |
| vm.nr_overcommit_hugepages   | 0     |
| vm.swappiness                | 10    |
| vm.watermark_boost_factor    | 15000 |
| vm.watermark_scale_factor    | 10    |
| vm.zone_reclaim_mode         | 0     |

-----

17. /sys/kernel/mm/transparent\_hugepage

|                |          |             |               |           |            |
|----------------|----------|-------------|---------------|-----------|------------|
| defrag         | always   | defer       | defer+madvise | [madvise] | never      |
| enabled        | [always] | madvise     | never         |           |            |
| hpage_pmd_size | 2097152  |             |               |           |            |
| shmem_enabled  | always   | within_size | advise        | [never]   | deny force |

-----

18. /sys/kernel/mm/transparent\_hugepage/khugepaged

|                       |       |
|-----------------------|-------|
| alloc_sleep_millisecs | 60000 |
| defrag                | 1     |
| max_ptes_none         | 511   |
| max_ptes_swap         | 64    |
| pages_to_scan         | 4096  |
| scan_sleep_millisecs  | 10000 |

-----

19. OS release

|            |                              |                |
|------------|------------------------------|----------------|
| From       | /etc/*-release               | /etc/*-version |
| os-release | Red Hat Enterprise Linux 8.4 | (Ootpa)        |

-----

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## Platform Notes (Continued)

redhat-release Red Hat Enterprise Linux release 8.4 (Ootpa)  
system-release Red Hat Enterprise Linux release 8.4 (Ootpa)

```

-----
20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
itlb_multihit      Not affected
lltf               Not affected
mds                Not affected
meltdown           Not affected
spec_store_bypass Mitigation: Speculative Store Bypass disabled via prctl and seccomp
spectre_v1         Mitigation: usercopy/swapgs barriers and __user pointer sanitization
spectre_v2         Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
srbds              Not affected
tsx_async_abort    Not affected

```

For more information, see the Linux documentation on hardware vulnerabilities, for example <https://www.kernel.org/doc/html/latest/admin-guide/hw-vuln/index.html>

```

-----
21. Disk information
SPEC is set to: /home/ic22u1
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   878G  132G  747G  16% /home

```

```

-----
22. /sys/devices/virtual/dmi/id
Vendor:          ASUSTeK COMPUTER INC.
Product:         RS720-E10-RS12
Product Family: Server
Serial:          012345678901

```

```

-----
23. dmidecode
Additional information from dmidecode 3.2 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:
  16x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

```

```

-----
24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:     American Megatrends Inc.
BIOS Version:    0802
BIOS Date:       04/29/2022
BIOS Revision:   8.2

```



# SPEC CPU®2017 Floating Point Speed Result

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**ASUSTeK Computer Inc.**  
ASUS RS720-E10-RS12(Z12PP-D32) Server System  
(2.20 GHz, Intel Xeon Platinum 8352Y)

SPECspeed®2017\_fp\_base = 251  
SPECspeed®2017\_fp\_peak = 251

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

**Test Date:** Feb-2023  
**Hardware Availability:** Apr-2022  
**Software Availability:** May-2022

## Compiler Version Notes

=====  
C | 619.lbm\_s(base, peak) 638.imagick\_s(base, peak)  
| 644.nab\_s(base, peak)  
=====

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
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=====  
C++, C, Fortran | 607.cactuBSSN\_s(base, peak)  
=====

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version  
2022.1.0 Build 20220316  
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=====  
Fortran | 603.bwaves\_s(base, peak) 649.fotonik3d\_s(base, peak)  
| 654.roms\_s(base, peak)  
=====

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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version  
2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
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=====  
Fortran, C | 621.wrf\_s(base, peak) 627.cam4\_s(base, peak)  
| 628.pop2\_s(base, peak)  
=====

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## Base Compiler Invocation

C benchmarks:

icx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

## 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:

-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto

-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp

-DSPEC\_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:

-m64 -Wl,-z,muldefs -DSPEC\_OPENMP -xCORE-AVX512 -Ofast -ffast-math

-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp

-nostandard-realloc-lhs -align array32byte -auto

-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:

-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto

-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

```
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp  
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

## Peak Compiler Invocation

C benchmarks:

```
icx
```

Fortran benchmarks:

```
ifx
```

Benchmarks using both Fortran and C:

```
ifx icx
```

Benchmarks using Fortran, C, and C++:

```
icpx icx ifx
```

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

```
619.lbm_s: basepeak = yes
```

```
638.imagick_s: basepeak = yes
```

```
644.nab_s: basepeak = yes
```

Fortran benchmarks:

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## Peak Optimization Flags (Continued)

603.bwaves\_s: basepeak = yes

649.fotonik3d\_s: basepeak = yes

654.roms\_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf\_s: basepeak = yes

```
627.cam4_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

628.pop2\_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN\_s: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z12-V1.2.html>  
[http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64\\_revA.2022-10-12.html](http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.2022-10-12.html)

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z12-V1.2.xml>  
[http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64\\_revA.2022-10-12.xml](http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.2022-10-12.xml)

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