## SPEC CPU®2017 Integer Speed Result

**ASUSTeK Computer Inc.**  
ASUS RS720-E10(Z12PP-D32) Server System  
(2.20 GHz, Intel Xeon Gold 6338N)

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>ASUSTeK Computer Inc.</th>
<th>Test Date:</th>
<th>Nov-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by</td>
<td>ASUSTeK Computer Inc.</td>
<td>Hardware Availability:</td>
<td>Apr-2022</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Software Availability:</td>
<td>May-2022</td>
</tr>
</tbody>
</table>

### Thread Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>64</td>
<td>7.52</td>
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<tr>
<td>602.gcc_s</td>
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<td>10.7</td>
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<tr>
<td>620.omnetpp_s</td>
<td>64</td>
<td></td>
<td>20.2</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>21.0</td>
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<tr>
<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
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<td>18.0</td>
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<tr>
<td>641.leela_s</td>
<td>64</td>
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<td>20.3</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>64</td>
<td></td>
<td>25.3</td>
</tr>
</tbody>
</table>

### CPU2017 License: 9016

### 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.

### Hardware

**CPU Name:**  
Intel Xeon Gold 6338N

**Max MHz:**  
3500

**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, running at 2666)

**Storage:**  
1 x 1 TB SATA SSD

**Other:**  
None
### Results Table

<table>
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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>64</td>
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<td>237</td>
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**Compiler Notes**

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalanchmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

**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,scatter"
- LD_LIBRARY_PATH = "*/home/ic22u1/lib/intel64:/home/ic22u1/je5.0.1-64"
- MALLOC_CONF = "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
SPEC CPU®2017 Integer Speed Result
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SPECspeed®2017_int_base = 12.6
SPECspeed®2017_int_peak = 12.8

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

Test Date: Nov-2022
Hardware Availability: Apr-2022
Software Availability: May-2022

General Notes (Continued)

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
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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/ic22u1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef016ac6a64d
running on localhost.localdomain Wed Nov 30 06:19:53 2022

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 6338N CPU @ 2.20GHz
  2 "physical id"s (chips)
  64 "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 : 32
  siblings  : 32
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31

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
  Model:               106

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

**Test Date:** Nov-2022  
**Hardware Availability:** Apr-2022  
**Software Availability:** May-2022

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**Platform Notes (Continued)**

- **Model name:** Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz  
- **BIOS Model name:** Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz  
- **Stepping:** 6  
- **CPU MHz:** 3095.720  
- **CPU max MHz:** 3500.0000  
- **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  
- **FPU vme dpe ts mtrr pse msr mcr pmo pga mca cmovpat pse36 clflush dtlb kml constant_tsc arch_perfmon pebs bts rep_good nolxt xtopology nonstop_tsc cpuid apicperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lic movbe popcnt tsc_deadline_timer xtune avx f16c rdrand lIC

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specspeed®2017_int_base = 12.6
specspeed®2017_int_peak = 12.8

Test Date: Nov-2022
Hardware Availability: Apr-2022
Software Availability: May-2022

Platform Notes (Continued)

os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.4 (Ootpa)"
ID="rhel"
ID_<LIKE>="fedora"
VERSION_<LIKE>="8.4"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"
ANSI_<COLOR>="0;31"
redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.4:ga
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

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RBB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TXS Asynchronous Abort): Not affected

run-level 3 Nov 30 06:19
SPEC is set to: /home/ic22u1

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 878G 119G 760G 14% /home

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

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, configured at 2666

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 0802
BIOS Date: 04/29/2022
BIOS Revision: 8.2

(End of data from sysinfo program)
ASUSTeK Computer Inc.

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Compiler Version Notes

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<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316</td>
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<td>Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

600.perlbench_s: -DSPEC_LP64  -DSPEC_LINUX_X64
602.gcc_s:         -DSPEC_LP64
605.mcf_s:         -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64  -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
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Base Optimization Flags

C benchmarks:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
600.perlbench_s:-m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/jemalloc64-5.0.1/lib

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<td>Tested by:</td>
<td>ASUSTeK Computer Inc.</td>
<td>Hardware Availability:</td>
<td>Apr-2022</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>May-2022</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| SPECspeed®2017_int_base = 12.6 |
| SPECspeed®2017_int_peak = 12.8 |

### Peak Optimization Flags (Continued)

600.perlbench_s (continued):
- `-ljemalloc`

602.gcc_s: `-m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)`  
- `-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3`  
- `-ffast-math -flto -mfpmath=sse -funroll-loops`  
- `-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP`  
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

605.mcf_s: basepeak = yes

625.x264_s: `-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3`  
- `-ffast-math -flto -mfpmath=sse -funroll-loops`  
- `-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP`  
- `-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

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:

ASUSTeK Computer Inc.
ASUS RS720-E10(Z12PP-D32) Server System
(2.20 GHz, Intel Xeon Gold 6338N)

SPECspeed®2017_int_base = 12.6
SPECspeed®2017_int_peak = 12.8

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

Test Date: Nov-2022
Hardware Availability: Apr-2022
Software Availability: May-2022