## SPEC CPU® 2017 Integer Speed Result

**ASUSTeK Computer Inc.**  
ASUS ESC8000 G4(Z11PG-D24) Server System  
(3.90 GHz, Intel Xeon Gold 6250)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base = 11.8</th>
<th>SPECspeed®2017_int_peak = 11.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Date: Feb-2020</td>
<td>Hardware Availability: Feb-2020</td>
</tr>
<tr>
<td>CPU2017 License: 9016</td>
<td>Software Availability: May-2019</td>
</tr>
<tr>
<td>Test Sponsor: ASUSTeK Computer Inc.</td>
<td>Tested by: ASUSTeK Computer Inc.</td>
</tr>
</tbody>
</table>

### Threads

<table>
<thead>
<tr>
<th>Thread</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>7.50</td>
<td>8.72</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>11.7</td>
<td>14.6</td>
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<tr>
<td>605.mcf_s</td>
<td>32</td>
<td>10.6</td>
<td>14.6</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>14.0</td>
<td>14.0</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
<td>15.9</td>
<td>15.9</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td>6.35</td>
<td>18.5</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>5.41</td>
<td>25.8</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td></td>
<td>25.9</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td></td>
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</tbody>
</table>

---

### Software

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 15</td>
</tr>
<tr>
<td>Kernel</td>
<td>4.12.14-23-default</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 19.0.4.227 of Intel C/C++</td>
</tr>
<tr>
<td>Compiler Build</td>
<td>20190416 for Linux</td>
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<tr>
<td>Fortran</td>
<td>Version 19.0.4.227 of Intel Fortran</td>
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<tr>
<td>Compiler Build</td>
<td>20190416 for Linux</td>
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<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>Version 6102 released Dec-2019</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>jemalloc: jemalloc memory allocator library V5.0.1</td>
</tr>
<tr>
<td>Power Management</td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 6250</td>
</tr>
<tr>
<td>Max MHz</td>
<td>4500</td>
</tr>
<tr>
<td>Nominal</td>
<td>3900</td>
</tr>
<tr>
<td>Enabled</td>
<td>16 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1, 2 chip(s)</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Cache L2</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Cache L3</td>
<td>35.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 1 TB SATA SSD</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
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</tbody>
</table>
SPEC CPU®2017 Integer Speed Result

ASUSTeK Computer Inc.
ASUS ESC8000 G4(Z11PG-D24) Server System
(3.90 GHz, Intel Xeon Gold 6250)

SPECspeed®2017_int_base = 11.8
SPECspeed®2017_int_peak = 11.9

Results Table

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<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>239</td>
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</table>

SPECspeed®2017_int_base = 11.8
SPECspeed®2017_int_peak = 11.9

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,scatter"
LD_LIBRARY_PATH = "/spec2017_110/lib/intel64:/spec2017_110/je5.0.1-64"
OMP_STACKSIZE = "192M"

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

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.

(Continued on next page)
ASUSTeK Computer Inc.
ASUS ESC8000 G4(Z11PG-D24) Server System
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SPECspeed®2017_int_base = 11.8
SPECspeed®2017_int_peak = 11.9

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

The jemalloc library was configured and built at default for 32bit (i686) and 64bit (x86_64) targets; 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

BIOS Configuration:
VT-d = Disabled
Patrol Scrub = Disabled
ENERGY_PERF_BIAS_CFG mode = performance
CSM Support = Disabled
Engine Boost = Level3(Max)
Enforce POR = Disable
Memory Frequency = 2933
LLC dead line allc = Disabled
SR-IOV Support = Disabled

Sysinfo program /spec2017_110/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on linux-gh78 Fri Feb 28 09:10:10 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) Gold 6250 CPU @ 3.90GHz
  2 "physical id"s (chips)
  32 "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 : 8
siblings : 16
physical 0: cores 2 3 6 13 18 19 24 28
physical 1: cores 1 2 3 5 6 18 19 29

From lsccpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31

General Notes (Continued)

Platform Notes

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

- **Thread(s) per core:** 2
- **Core(s) per socket:** 8
- **Socket(s):** 2
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Gold 6250 CPU @ 3.90GHz
- **Stepping:** 7
- **CPU MHz:** 3900.000
- **CPU max MHz:** 4500.0000
- **CPU min MHz:** 1200.0000
- **BogoMIPS:** 7800.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 36608K
- **NUMA node0 CPU(s):** 0-7,16-23
- **NUMA node1 CPU(s):** 8-15,24-31
- **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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperpif tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg xmvb pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebx cat13 cdp13 invpcid_single intel_patin mba tpr_shadow vmx flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmqr mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaveas cmqm llc cmq_occup_llc cmq_mbm_total cmq_mbm_local ibpb ibrs stibp dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pkc ospte avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data

cache size : 36608 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 16 17 18 19 20 21 22 23
node 0 size: 385594 MB
node 0 free: 385107 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 387016 MB
node 1 free: 385717 MB
node distances:
node 0  1

(Continued on next page)
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CPU2017 License: 9016
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Platform Notes (Continued)

0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 791154164 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

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-gh78 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-3620 (L1 Terminal Fault): No status reported
Microarchitectural Data Sampling: No status reported
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Feb 27 13:36
SPEC is set to: /spec2017_110

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 929G 23G 906G 3% /

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 6102 12/19/2019
Vendor: ASUSTeK COMPUTER INC.
Product: Z11PG-D24 Series
Product Family: Server
Serial: System Serial Number

(Continued on next page)
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.

Memory:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C       | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_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.
------------------------------------------------------------------------------

==============================================================================
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_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.
------------------------------------------------------------------------------

==============================================================================
Fortran | 648.exchange2_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.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64
ASUSTeK Computer Inc.  
ASUS ESC8000 G4(Z11PG-D24) Server System  
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- **Software Availability:** May-2019  

**Base Compiler Invocation (Continued)**

Fortran benchmarks:
ifort -m64

**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
```

**Base Optimization Flags**

**C benchmarks:**

- W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
- qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
- L/usr/local/je5.0.1-64/lib -ljemalloc

**C++ benchmarks:**

- W1, -z, muldefs -xCORE-AVX512 -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:**

- xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4  
- nostandard-realloc-lhs

**Peak Compiler Invocation**

**C benchmarks:**

icc -m64 -std=c11

**C++ benchmarks:**

icpc -m64

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

Fortran benchmarks:
ifort -m64

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC.Suppress_OpenMP -gopenmp
-DSPEC_OPENMP -fno-strict-overflow
-L/usr/local/je5.0.1-64/lib -ljemalloc

602.gcc_s: basepeak = yes

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-DSPEC.Suppress_OpenMP -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC.Suppress_OpenMP -gopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
ASUSTeK Computer Inc.  
ASUS ESC8000 G4(Z11PG-D24) Server System  
(3.90 GHz, Intel Xeon Gold 6250)  

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<tr>
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<th>9016</th>
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<tr>
<td>Test Sponsor:</td>
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**SPEC CPU®2017 Integer Speed Result**

**SPECspeed®2017_int_base = 11.8**

**SPECspeed®2017_int_peak = 11.9**

---

**Peak Optimization Flags (Continued)**

623.xalancbmk_s (continued):
- -lqkmalloc

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:

http://www.spec.org/cpu2017/flags/ASUSTeKPlatform-Settings-z11-V2.0-revF.xml

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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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