



# SPEC CPU®2017 Integer Speed Result

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## ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System  
(2.20 GHz, Intel Xeon Silver 4210)

SPECspeed®2017\_int\_base = 8.44

SPECspeed®2017\_int\_peak = 8.61

CPU2017 License: 9016

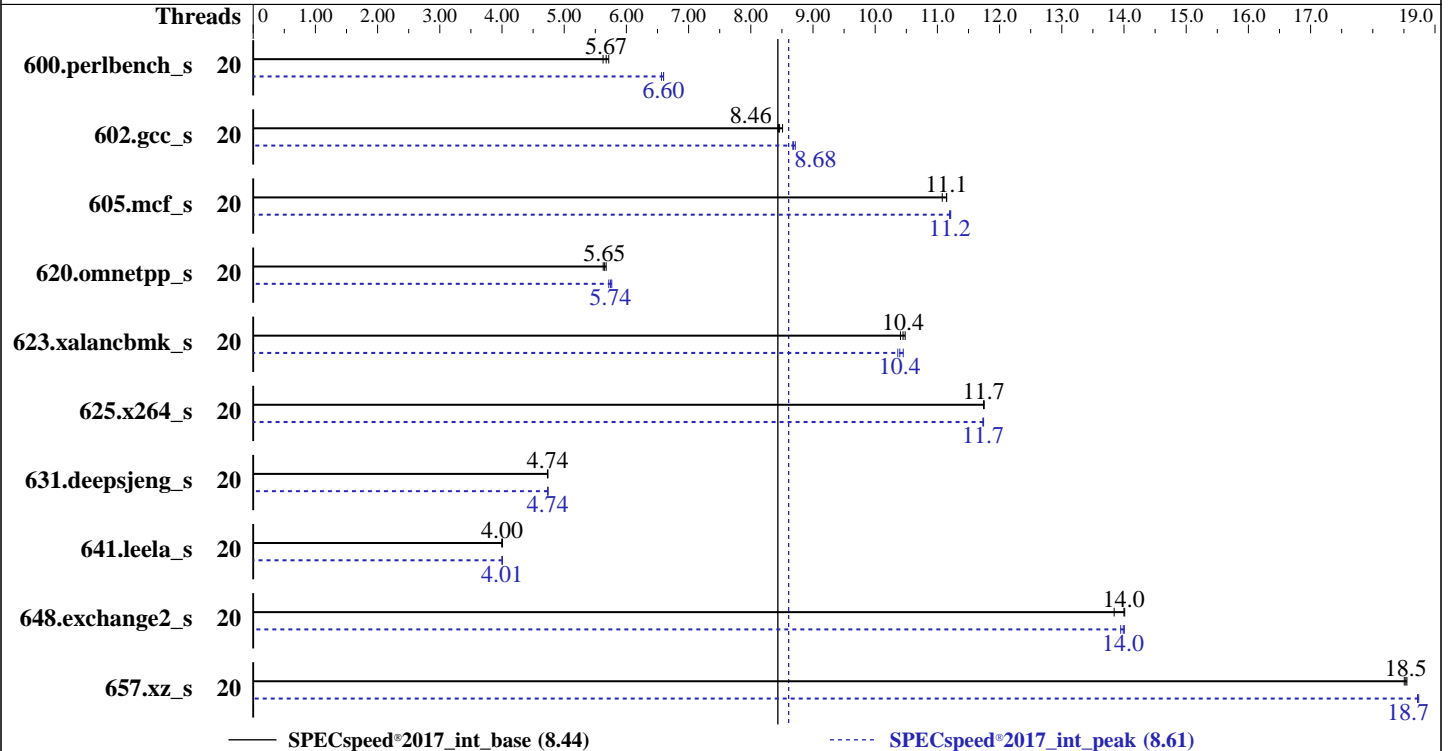
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Aug-2019

Hardware Availability: Apr-2019

Software Availability: May-2019



### Hardware

CPU Name: Intel Xeon Silver 4210  
 Max MHz: 3200  
 Nominal: 2200  
 Enabled: 20 cores, 2 chips  
 Orderable: 1,2 chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 13.75 MB I+D on chip per chip  
 Other: None  
 Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)  
 Storage: 1 x 1 TB SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15  
 Kernel 4.12.14-23-default  
 Compiler: C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux;  
 Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux  
 Parallel: Yes  
 Firmware: Version 5102 released Feb-2019  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc: jemalloc memory allocator library V5.0.1  
 Power Management: --



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## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	20	316	5.63	311	5.72	<b>313</b>	<b>5.67</b>	20	270	6.56	269	6.60	<b>269</b>	<b>6.60</b>
602.gcc_s	20	468	8.51	<b>471</b>	<b>8.46</b>	472	8.44	20	457	8.71	<b>458</b>	<b>8.68</b>	459	8.68
605.mcf_s	20	426	11.1	<b>424</b>	<b>11.1</b>	423	11.2	20	<b>421</b>	<b>11.2</b>	421	11.2	422	11.2
620.omnetpp_s	20	287	5.67	<b>289</b>	<b>5.65</b>	290	5.63	20	283	5.76	285	5.72	<b>284</b>	<b>5.74</b>
623.xalancbmk_s	20	<b>136</b>	<b>10.4</b>	135	10.5	136	10.4	20	137	10.4	<b>136</b>	<b>10.4</b>	136	10.5
625.x264_s	20	150	11.8	<b>150</b>	<b>11.7</b>	150	11.7	20	150	11.7	150	11.7	<b>150</b>	<b>11.7</b>
631.deepsjeng_s	20	<b>303</b>	<b>4.74</b>	303	4.74	303	4.73	20	303	4.74	<b>302</b>	<b>4.74</b>	302	4.74
641.leela_s	20	426	4.01	<b>426</b>	<b>4.00</b>	427	4.00	20	427	4.00	426	4.01	<b>426</b>	<b>4.01</b>
648.exchange2_s	20	212	13.8	210	14.0	<b>210</b>	<b>14.0</b>	20	210	14.0	<b>210</b>	<b>14.0</b>	211	13.9
657.xz_s	20	333	18.5	<b>334</b>	<b>18.5</b>	334	18.5	20	330	18.7	330	18.7	<b>330</b>	<b>18.7</b>

SPECspeed®2017\_int\_base = **8.44**

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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"

## General Notes

Environment variables set by runcpu before the start of the run:

KMP\_AFFINITY = "granularity=fine,scatter"

LD\_LIBRARY\_PATH = "/spec2017\_19u4/lib/intel64:/spec2017\_19u4/je5.0.1-64"

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
```

jemalloc: configured and built at default for

32bit (i686) and 64bit (x86\_64) targets;

jemalloc: built with the RedHat Enterprise 7.4,

and the system compiler gcc 4.8.5;

jemalloc: sources available from jemalloc.net or

<https://github.com/jemalloc/jemalloc/releases>

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.



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### Platform Notes

BIOS Configuration:

VT-d = Disabled

Patrol Scrub = Disabled

HyperThreading = Disabled

ENERGY\_PERF\_BIAS\_CFG mode = performance

CSM Support = Disabled

Engine Boost = Level3(Max)

LLC dead line allc = Disabled

SR-IOV Support = Disabled

    Sysinfo program /spec2017\_19u4/bin/sysinfo

    Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

    running on linux-gh78 Thu Aug 1 04:02:43 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) Silver 4210 CPU @ 2.20GHz

        2 "physical id"s (chips)

        20 "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 : 10

        siblings : 10

        physical 0: cores 0 1 2 3 4 8 9 10 11 12

        physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:

    Architecture: x86\_64

    CPU op-mode(s): 32-bit, 64-bit

    Byte Order: Little Endian

    CPU(s): 20

    On-line CPU(s) list: 0-19

    Thread(s) per core: 1

    Core(s) per socket: 10

    Socket(s): 2

    NUMA node(s): 2

    Vendor ID: GenuineIntel

    CPU family: 6

    Model: 85

    Model name: Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz

    Stepping: 6

    CPU MHz: 2200.000

    CPU max MHz: 3200.0000

    CPU min MHz: 1000.0000

    BogoMIPS: 4400.00

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### Platform Notes (Continued)

```

Virtualization:      VT-x
Lld cache:          32K
Lli cache:          32K
L2 cache:           1024K
L3 cache:           14080K
NUMA node0 CPU(s):  0-9
NUMA node1 CPU(s):  10-19
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
aperfmpperf tsc_known_freq 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 aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault
epb cat_l3 cdp_l3 invpcid_single mba tpr_shadow vnmi flexpriority ept vpid fsgsbase
tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq
rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec
xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local ibpb ibrs stibp
dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
arch_capabilities ssbd

```

```

/proc/cpuinfo cache data
cache size : 14080 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
node 0 size: 385579 MB
node 0 free: 382952 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19
node 1 size: 386995 MB
node 1 free: 386454 MB
node distances:
node  0  1
0:   10  21
1:   21  10

```

```

From /proc/meminfo
MemTotal:      791116172 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15"
VERSION_ID="15"

```

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### Platform Notes (Continued)

```
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="/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-2017-5754 (Meltdown): Not affected
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 Jul 31 11:34

SPEC is set to: /spec2017\_19u4

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 929G 15G 914G 2% /
```

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. 5102 02/11/2019

Memory:

24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2400

(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)
```

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## Compiler Version Notes (Continued)

| 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

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



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## Base Optimization Flags

C benchmarks:

```
-Wl,-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:

```
-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  
-lqkmallocc
```

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
```

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 -qopenmp  
-DSPEC_OPENMP -fno-strict-overflow  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

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## Peak Optimization Flags (Continued)

602.gcc\_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  
-L/usr/local/je5.0.1-64/lib -ljemalloc

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 -qopenmp -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 -qopenmp -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 -qopenmp  
-DSPEC\_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:

620.omnetpp\_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  
-L/usr/local/IntelCompiler19/compilers\_and\_libraries\_2019.4.227/linux/compiler/lib/intel64  
-lqkmalloc

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  
-lqkmalloc

631.deepsjeng\_s: Same as 623.xalancbmk\_s

641.leela\_s: Same as 623.xalancbmk\_s

Fortran benchmarks:

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

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

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z11-V2.0-revE.html>

<http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html>





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

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z11-v2.0-revE.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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