



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System  
(2.10 GHz, Intel Xeon Gold 6230)

SPECspeed®2017\_int\_base = 10.5

SPECspeed®2017\_int\_peak = 10.7

CPU2017 License: 9016

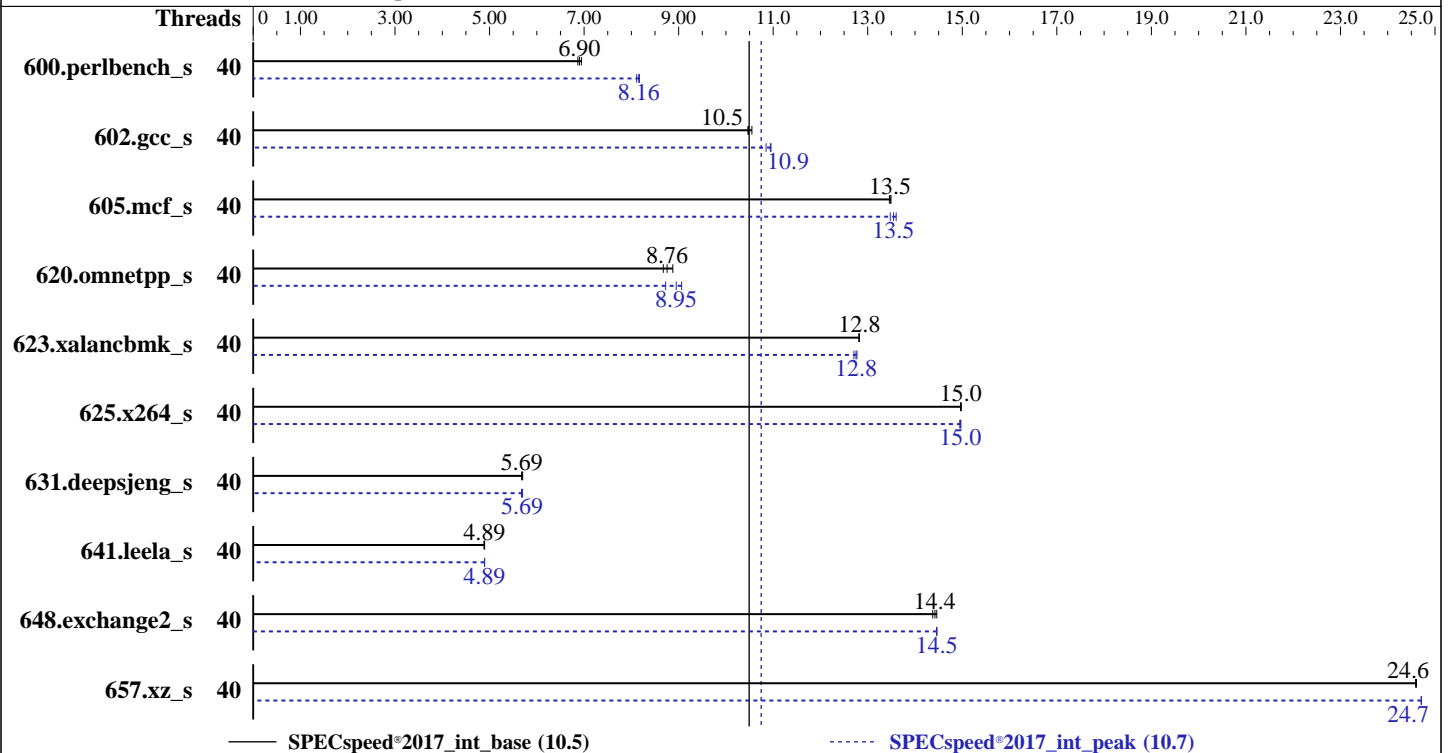
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Jun-2019

Hardware Availability: Apr-2019

Software Availability: Nov-2018



### Hardware

CPU Name: Intel Xeon Gold 6230  
 Max MHz: 3900  
 Nominal: 2100  
 Enabled: 40 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: 27.5 MB I+D on chip per chip  
 Other: None  
 Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
 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 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux;  
 Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 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	40	258	6.87	256	6.94	<b>257</b>	<b>6.90</b>	40	217	8.17	<b>218</b>	<b>8.16</b>	219	8.11
602.gcc_s	40	380	10.5	377	10.5	<b>380</b>	<b>10.5</b>	40	<b>364</b>	<b>10.9</b>	367	10.8	364	11.0
605.mcf_s	40	<b>350</b>	<b>13.5</b>	350	13.5	351	13.5	40	<b>349</b>	<b>13.5</b>	347	13.6	350	13.5
620.omnetpp_s	40	<b>186</b>	<b>8.76</b>	188	8.68	184	8.88	40	180	9.06	187	8.73	<b>182</b>	<b>8.95</b>
623.xalancbmk_s	40	111	12.8	110	12.8	<b>111</b>	<b>12.8</b>	40	111	12.8	<b>111</b>	<b>12.8</b>	112	12.7
625.x264_s	40	118	15.0	<b>118</b>	<b>15.0</b>	118	15.0	40	118	15.0	<b>118</b>	<b>15.0</b>	118	14.9
631.deepsjeng_s	40	<b>252</b>	<b>5.69</b>	252	5.68	251	5.70	40	251	5.70	253	5.67	<b>252</b>	<b>5.69</b>
641.leela_s	40	349	4.88	348	4.90	<b>349</b>	<b>4.89</b>	40	349	4.89	<b>349</b>	<b>4.89</b>	348	4.90
648.exchange2_s	40	<b>204</b>	<b>14.4</b>	203	14.5	205	14.4	40	203	14.5	<b>203</b>	<b>14.5</b>	203	14.5
657.xz_s	40	251	24.6	251	24.6	<b>251</b>	<b>24.6</b>	40	250	24.7	250	24.7	<b>250</b>	<b>24.7</b>

SPECspeed®2017\_int\_base = **10.5**

SPECspeed®2017\_int\_peak = **10.7**

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,compact,1,0"

LD\_LIBRARY\_PATH = "/spec2017/lib/ia32:/spec2017/lib/intel64:"

/spec2017/je5.0.1-32:/spec2017/je5.0.1-64"

OMP\_STACKSIZE = "192M"

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

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)

Enforce POR = Disable

Memory Frequency = 2933

LLC dead line allc = Disabled

SR-IOV Support = Disabled

Sysinfo program /spec2017/bin/sysinfo

Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

running on linux-gh78 Thu Jun 13 11:11:46 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) Gold 6230 CPU @ 2.10GHz

2 "physical id"s (chips)

40 "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 : 20

siblings : 20

physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 40

On-line CPU(s) list: 0-39

Thread(s) per core: 1

Core(s) per socket: 20

Socket(s): 2

NUMA node(s): 2

Vendor ID: GenuineIntel

CPU family: 6

Model: 85

Model name: Intel(R) Xeon(R) Gold 6230 CPU @ 2.10GHz

Stepping: 7

CPU MHz: 2100.000

CPU max MHz: 3900.0000

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### Platform Notes (Continued)

```

CPU min MHz:      800.0000
BogoMIPS:         4200.00
Virtualization:   VT-x
L1d cache:       32K
L1i cache:       32K
L2 cache:        1024K
L3 cache:        28160K
NUMA node0 CPU(s): 0-19
NUMA node1 CPU(s): 20-39
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 : 28160 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 12 13 14 15 16 17 18 19
node 0 size: 385577 MB
node 0 free: 384355 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
node 1 size: 386993 MB
node 1 free: 385764 MB
node distances:
node  0  1
 0:  10  21
 1:  21  10

```

```

From /proc/meminfo
MemTotal:      791112348 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

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

```

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## Platform Notes (Continued)

```

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-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 Jun 13 09:19

SPEC is set to: /spec2017

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4        xfs   929G  11G  919G   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 2934

(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 19.0.1.144 Build 20181018

```

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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### Compiler Version Notes (Continued)

```

=====
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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 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_2019.1.144/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
```

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\_2019.1.144/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\_2019.1.144/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-revD.2019-07-09.html>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.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-revD.2019-07-09.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.xml>

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