



# SPEC® CPU2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## ASUSTeK Computer Inc.

ASUS RS720Q-E9(Z11PH-D12) Server System  
(2.60 GHz, Intel Xeon Gold 6126)

SPECspeed2017\_int\_base = 8.97

SPECspeed2017\_int\_peak = 9.20

CPU2017 License: 9016

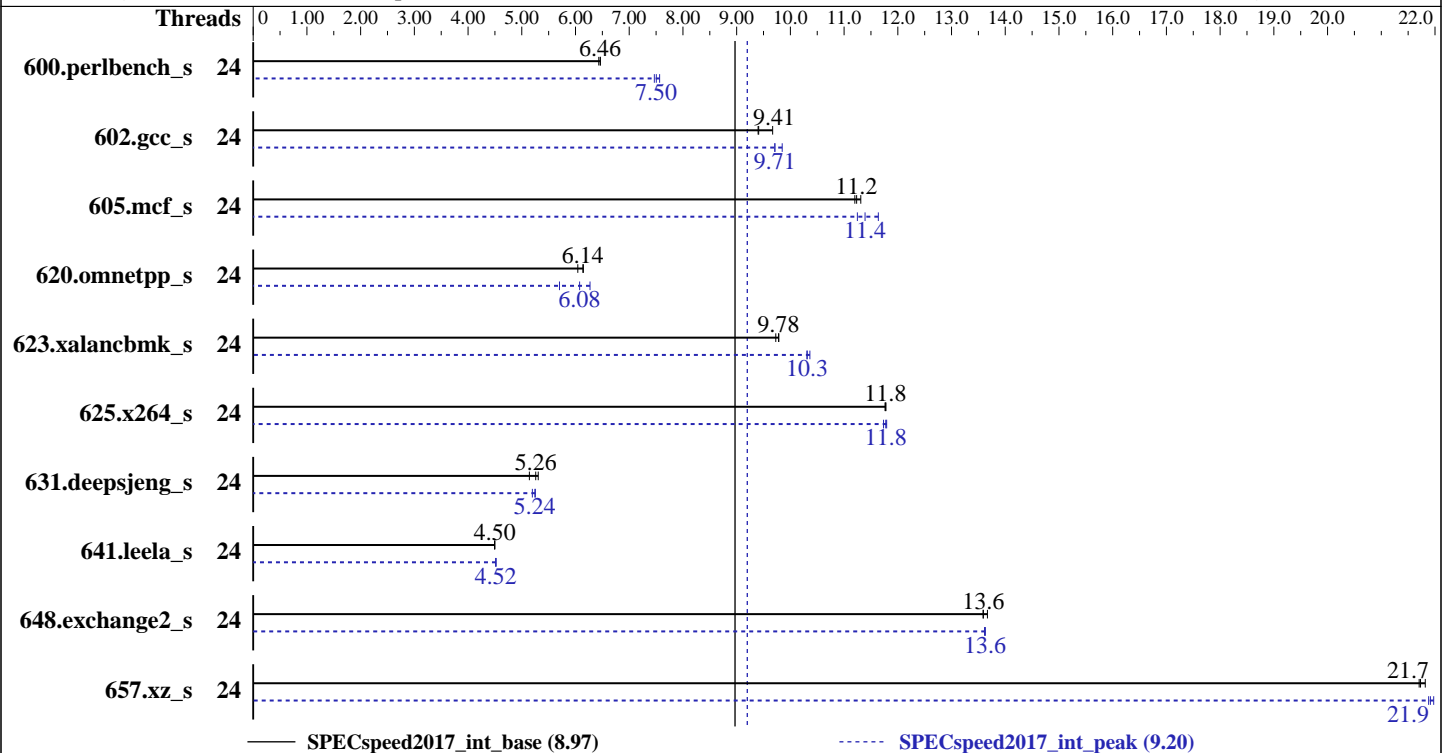
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Jul-2018

Hardware Availability: Mar-2018

Software Availability: Mar-2018



### Hardware

CPU Name: Intel Xeon Gold 6126  
 Max MHz.: 3700  
 Nominal: 2600  
 Enabled: 24 cores, 2 chips  
 Orderable: 1, 2 chip(s)  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 19.25 MB I+D on chip per chip  
 Other: None  
 Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)  
 Storage: 1 x 240 GB SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 (x86\_64) SP3  
 Kernel 4.4.120-94.17-default  
 Compiler: C/C++: Version 18.0.3.222 of Intel C/C++  
 Compiler for Linux;  
 Fortran: Version 18.0.3.222 of Intel Fortran  
 Compiler for Linux  
 Parallel: Yes  
 Firmware: Version 0905 released Mar-2018  
 File System: btrfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: jemalloc: jemalloc memory allocator library  
 V5.0.1



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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	24	<b>275</b>	<b>6.46</b>	276	6.43	275	6.46	24	235	7.57	<b>237</b>	<b>7.50</b>	238	7.47
602.gcc_s	24	412	9.67	424	9.40	<b>423</b>	<b>9.41</b>	24	404	9.85	410	9.71	<b>410</b>	<b>9.71</b>
605.mcf_s	24	<b>420</b>	<b>11.2</b>	417	11.3	422	11.2	24	406	11.6	420	11.2	<b>414</b>	<b>11.4</b>
620.omnetpp_s	24	270	6.04	<b>266</b>	<b>6.14</b>	265	6.15	24	260	6.27	286	5.70	<b>268</b>	<b>6.08</b>
623.xalancbmk_s	24	145	9.78	<b>145</b>	<b>9.78</b>	146	9.73	24	<b>137</b>	<b>10.3</b>	137	10.4	137	10.3
625.x264_s	24	<b>150</b>	<b>11.8</b>	150	11.8	150	11.8	24	150	11.8	<b>150</b>	<b>11.8</b>	150	11.7
631.deepsjeng_s	24	<b>272</b>	<b>5.26</b>	279	5.14	270	5.31	24	276	5.20	273	5.25	<b>273</b>	<b>5.24</b>
641.leela_s	24	379	4.50	<b>380</b>	<b>4.50</b>	380	4.49	24	378	4.52	<b>378</b>	<b>4.52</b>	377	4.52
648.exchange2_s	24	215	13.7	216	13.6	<b>216</b>	<b>13.6</b>	24	<b>216</b>	<b>13.6</b>	216	13.6	216	13.6
657.xz_s	24	<b>284</b>	<b>21.7</b>	283	21.8	285	21.7	24	281	22.0	<b>282</b>	<b>21.9</b>	283	21.9

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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/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 i7-4790 CPU + 32GB RAM

memory using Redhat Enterprise Linux 7.4

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>

Yes: 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:

SNC = Disabled

IMC interleaving = AUTO

Patrol Scrub = Disabled

VT-d = Disabled

HyperThreading = Disabled

Sysinfo program /spec2017/bin/sysinfo

Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

running on linux-pmm5 Thu Jul 5 14:25:05 2018

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 6126 CPU @ 2.60GHz

2 "physical id"s (chips)

24 "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 : 12

siblings : 12

physical 0: cores 0 1 3 5 6 8 9 10 11 12 13 14

physical 1: cores 0 1 3 4 5 6 8 9 10 11 12 13

From lscpu:

Architecture: x86\_64

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

Byte Order: Little Endian

CPU(s): 24

On-line CPU(s) list: 0-23

Thread(s) per core: 1

Core(s) per socket: 12

Socket(s): 2

NUMA node(s): 2

Vendor ID: GenuineIntel

CPU family: 6

Model: 85

Model name: Intel(R) Xeon(R) Gold 6126 CPU @ 2.60GHz

Stepping: 4

CPU MHz: 2601.000

CPU max MHz: 2601.0000

CPU min MHz: 1000.0000

BogoMIPS: 5356.23

Virtualization: VT-x

L1d cache: 32K

L1i cache: 32K

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### Platform Notes (Continued)

```

L2 cache:          1024K
L3 cache:          19712K
NUMA node0 CPU(s): 0-11
NUMA node1 CPU(s): 12-23
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
aperfmpperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx fl1c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm intel_pt rsb_ctxsw spec_ctrl stibp retpoline kaiser tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

```

```

/proc/cpuinfo cache data
cache size : 19712 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
node 0 size: 192067 MB
node 0 free: 191416 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
node 1 size: 193517 MB
node 1 free: 192479 MB
node distances:
node  0  1
  0:  10  21
  1:  21  10

```

```

From /proc/meminfo
MemTotal:          394838984 kB
HugePages_Total:      0
Hugepagesize:       2048 kB

```

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

```

SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP3"

```

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### Platform Notes (Continued)

```
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="/o:suse:sles:12:sp3"
```

```
uname -a:
Linux linux-pmm5 4.4.120-94.17-default #1 SMP Wed Mar 14 17:23:00 UTC 2018 (cf3a7bb)
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

```
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB
```

```
run-level 3 Jul 5 09:23
```

```
SPEC is set to: /spec2017
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda2       btrfs    203G      85G  118G  42% /
```

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. 0905 03/19/2018
Memory:
12x Kingston D4-26662R4-32G 32 GB 2 rank 2666
```

(End of data from sysinfo program)

### Compiler Version Notes

```
=====
CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base,
peak) 657.xz_s(base)
-----
```

```
icc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

```
=====
CC 600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
-----
```

```
icc (ICC) 18.0.3 20180410
```

(Continued on next page)



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## Compiler Version Notes (Continued)

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=====  
CXXC 620.omnetpp\_s(base) 623.xalancbmk\_s(base) 631.deepsjeng\_s(base)  
641.leela\_s(base)

icpc (ICC) 18.0.3 20180410

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

=====  
CXXC 620.omnetpp\_s(peak) 623.xalancbmk\_s(peak) 631.deepsjeng\_s(peak)  
641.leela\_s(peak)

icpc (ICC) 18.0.3 20180410

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

=====  
FC 648.exchange2\_s(base, peak)

ifort (IFORT) 18.0.3 20180410

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.gc\_s: -DSPEC\_LP64

605.mcf\_s: -DSPEC\_LP64

620.omnetpp\_s: -DSPEC\_LP64

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## Base Portability Flags (Continued)

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:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/je5.0.1-64/lib -ljemalloc

## Peak Compiler Invocation

C benchmarks:

icc -m64 -std=c11

C++ benchmarks (except as noted below):

icpc -m64

623.xalancbmk\_s: icpc -m32 -L/opt/intel/compilers\_and\_libraries\_2018/linux/lib/ia32

Fortran benchmarks:

ifort -m64

## Peak Portability Flags

600.perlbench\_s: -DSPEC\_LP64 -DSPEC\_LINUX\_X64

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## Peak Portability Flags (Continued)

```
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -D_FILE_OFFSET_BITS=64 -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
```

## 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=3 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -fno-strict-overflow
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_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=3
-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=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
657.xz_s: Same as 602.gcc_s
```

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=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

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## Peak Optimization Flags (Continued)

```
623.xalancbmk_s: -w1, -z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP  
-L/usr/local/je5.0.1-32/lib -ljemalloc
```

631.deepsjeng\_s: Same as 620.omnetpp\_s

641.leela\_s: Same as 620.omnetpp\_s

Fortran benchmarks:

```
-w1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

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.html>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html>

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.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml>

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