



SPEC® CPU2017 Integer Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720Q-E9(Z11PH-D12) Server System
(2.20 GHz, Intel Xeon Gold 5120)

SPECspeed2017_int_base = 7.89

SPECspeed2017_int_peak = 8.08

CPU2017 License: 9016

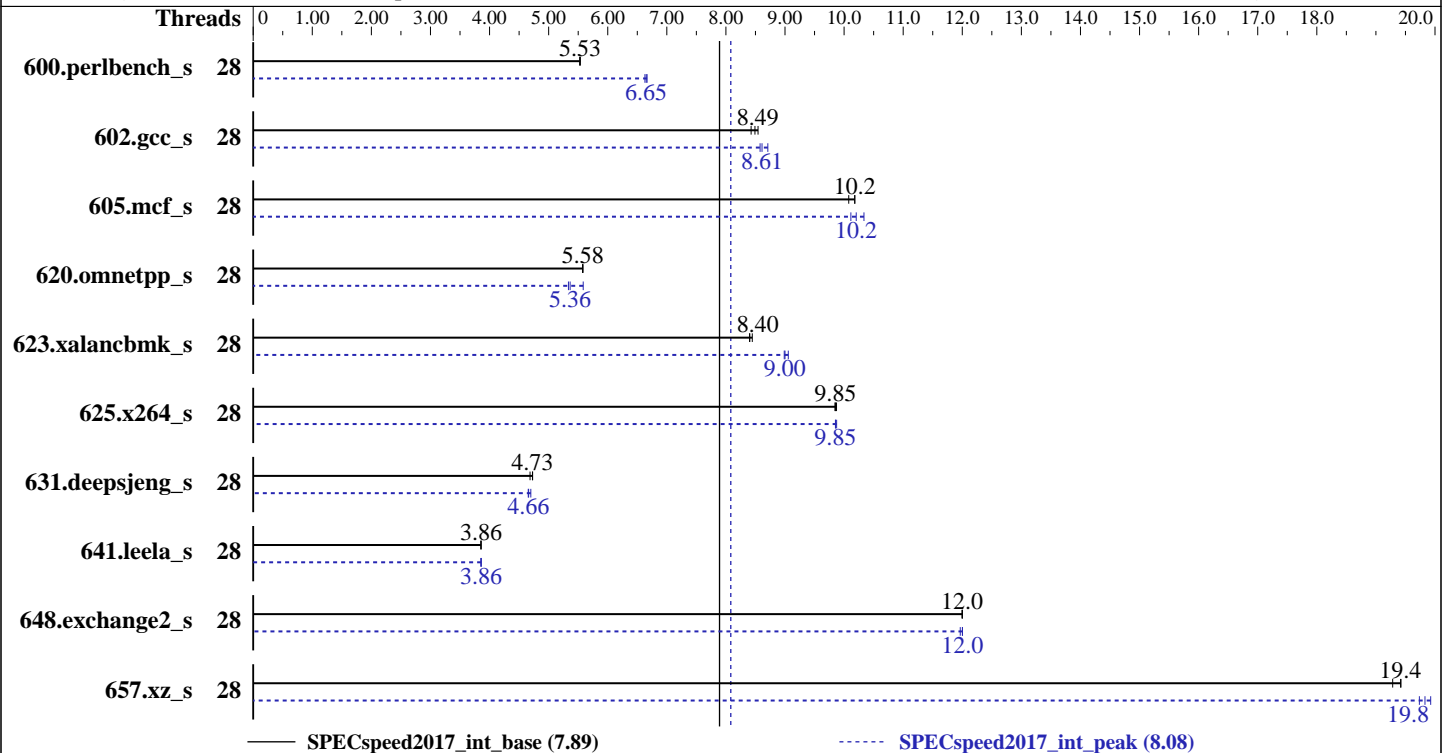
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Sep-2018

Hardware Availability: Mar-2018

Software Availability: Jun-2018



Hardware

CPU Name: Intel Xeon Gold 5120
 Max MHz.: 3200
 Nominal: 2200
 Enabled: 28 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, running at 2400)
 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	28	321	5.53	321	5.54	321	5.53	28	267	6.65	266	6.67	268	6.63
602.gcc_s	28	469	8.49	473	8.43	466	8.54	28	457	8.71	464	8.58	462	8.61
605.mcf_s	28	468	10.1	464	10.2	464	10.2	28	457	10.3	463	10.2	467	10.1
620.omnetpp_s	28	293	5.57	292	5.58	292	5.58	28	304	5.36	306	5.34	292	5.59
623.xalancbmk_s	28	169	8.40	168	8.45	169	8.40	28	156	9.06	157	9.00	158	8.99
625.x264_s	28	179	9.85	179	9.87	179	9.85	28	179	9.85	179	9.87	179	9.85
631.deepsjeng_s	28	303	4.73	303	4.73	306	4.69	28	307	4.66	305	4.70	308	4.66
641.leela_s	28	443	3.85	442	3.86	442	3.86	28	442	3.86	442	3.86	442	3.86
648.exchange2_s	28	245	12.0	245	12.0	245	12.0	28	245	12.0	246	12.0	245	12.0
657.xz_s	28	318	19.4	321	19.3	318	19.4	28	313	19.7	310	19.9	312	19.8

SPECspeed2017_int_base = **7.89**

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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 Mon Sep 17 18:39:26 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 5120 CPU @ 2.20GHz

 2 "physical id"s (chips)

 28 "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 : 14

 siblings : 14

 physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

 physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

From lscpu:

 Architecture: x86_64

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

 Byte Order: Little Endian

 CPU(s): 28

 On-line CPU(s) list: 0-27

 Thread(s) per core: 1

 Core(s) per socket: 14

 Socket(s): 2

 NUMA node(s): 2

 Vendor ID: GenuineIntel

 CPU family: 6

 Model: 85

 Model name: Intel(R) Xeon(R) Gold 5120 CPU @ 2.20GHz

 Stepping: 4

 CPU MHz: 2201.000

 CPU max MHz: 2201.0000

 CPU min MHz: 1000.0000

 BogoMIPS: 4532.21

 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):      0-13
NUMA node1 CPU(s):      14-27
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 f16c 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 12 13
node 0 size: 192067 MB
node 0 free: 182686 MB
node 1 cpus: 14 15 16 17 18 19 20 21 22 23 24 25 26 27
node 1 size: 193517 MB
node 1 free: 186354 MB
node distances:
node  0  1
  0:  10  21
  1:  21  10

```

```

From /proc/meminfo
MemTotal:        394838416 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 Sep 17 10:18

SPEC is set to: /spec2017

```
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sda2       btrfs    203G  116G   86G   58% /
```

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, configured at 2400

(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

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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

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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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -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:

```
-Wl,-z,muldefs -xCORE-AVX2 -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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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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