



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720-E9(Z11PP-D24) Server System
(2.40 GHz, Intel Xeon Silver 4214R)

SPECspeed®2017_int_base = 9.87

SPECspeed®2017_int_peak = 10.1

CPU2017 License: 9016

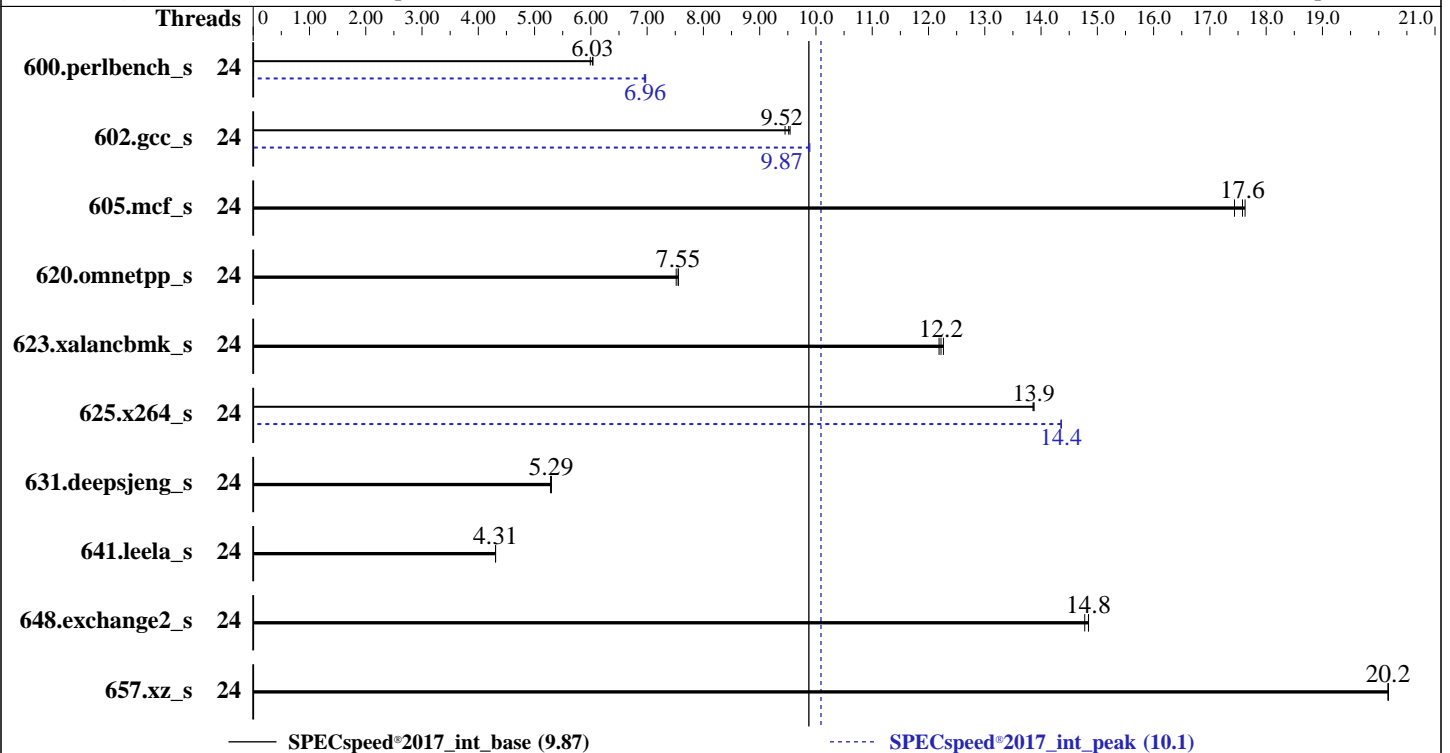
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Sep-2020

Hardware Availability: Feb-2020

Software Availability: Apr-2020



Hardware

CPU Name: Intel Xeon Silver 4214R
 Max MHz: 3500
 Nominal: 2400
 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: 16.5 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 SP1
 Kernel 4.12.14-195-default
 Compiler: C/C++: Version 19.1.1.217 of Intel C/C++ Compiler Build 20200306 for Linux;
 Fortran: Version 19.1.1.217 of Intel Fortran Compiler Build 20200306 for Linux
 Parallel: Yes
 Firmware: Version 6102 released Dec-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: BIOS and OS set to prefer performance at the cost of additional power usage



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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	296	5.99	294	6.03	294	6.04	24	255	6.97	255	6.96	255	6.95
602.gcc_s	24	421	9.45	417	9.54	418	9.52	24	403	9.87	403	9.89	404	9.87
605.mcf_s	24	268	17.6	271	17.4	269	17.6	24	268	17.6	271	17.4	269	17.6
620.omnetpp_s	24	217	7.52	216	7.55	216	7.55	24	217	7.52	216	7.55	216	7.55
623.xalancbmk_s	24	116	12.3	116	12.2	116	12.2	24	116	12.3	116	12.2	116	12.2
625.x264_s	24	127	13.9	127	13.9	127	13.9	24	123	14.4	123	14.4	123	14.4
631.deepsjeng_s	24	271	5.29	270	5.30	271	5.29	24	271	5.29	270	5.30	271	5.29
641.leela_s	24	396	4.31	396	4.31	396	4.31	24	396	4.31	396	4.31	396	4.31
648.exchange2_s	24	198	14.8	198	14.8	199	14.8	24	198	14.8	198	14.8	199	14.8
657.xz_s	24	307	20.2	306	20.2	307	20.2	24	307	20.2	306	20.2	307	20.2

SPECspeed®2017_int_base = **9.87**

SPECspeed®2017_int_peak = **10.1**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.

The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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 = "/191u1/lib/intel64:/191u1/je5.0.1-64"

MALLOC_CONF = "retain:true"

OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

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General Notes (Continued)

```
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.

```
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
```

Platform Notes

BIOS Configuration:

VT-d = Disabled

Patrol Scrub = Disabled

ENERGY_PERF_BIAS_CFG mode = performance

HyperThreading = Disabled

CSM Support = Disabled

Engine Boost = Level3(Max)

LLC dead line allc = Disabled

SR-IOV Support = Disabled

```
Sysinfo program /191ul/bin/sysinfo
```

```
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
```

```
running on linux-628j Thu Sep 3 22:58:37 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) Silver 4214R CPU @ 2.40GHz
```

```
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 2 3 4 5 8 9 10 11 12 13
```

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

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Platform Notes (Continued)

From lscpu:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
Address sizes:         46 bits physical, 48 bits virtual
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) Silver 4214R CPU @ 2.40GHz
Stepping:              7
CPU MHz:               2400.000
CPU max MHz:           3500.0000
CPU min MHz:           1000.0000
BogoMIPS:              4800.00
Virtualization:       VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              16896K
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 cpuid
aperfmpperf 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 intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced 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 dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
ospke avx512_vnni md_clear flush_l1d arch_capabilities

```

```

/proc/cpuinfo cache data
cache size : 16896 KB

```

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 2 nodes (0-1)

```

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Platform Notes (Continued)

```

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11
node 0 size: 385616 MB
node 0 free: 385289 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
node 1 size: 387039 MB
node 1 free: 386467 MB
node distances:
node 0 1
  0: 10 21
  1: 21 10

```

```

From /proc/meminfo
MemTotal:      791200288 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP1"
VERSION_ID="15.1"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp1"

```

```

uname -a:
Linux linux-628j 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

CVE-2018-3620 (L1 Terminal Fault):      Not affected
Microarchitectural Data Sampling:      Not affected
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: Enhanced IBRS, IBPB: conditional,
RSB filling

```

run-level 3 Sep 3 22:57

```

SPEC is set to: /191ul
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda4       xfs       932G      49G  884G   6% /

```

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Platform Notes (Continued)

```

From /sys/devices/virtual/dmi/id
  BIOS:      American Megatrends Inc. 6102 12/05/2019
  Vendor:    ASUSTeK COMPUTER INC.
  Product:   Z11PP-D24 Series
  Product Family: Server
  Serial:    System Serial Number

```

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) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
          | 625.x264_s(base, peak) 657.xz_s(base, peak)
=====

```

```

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
=====

```

```

=====
C          | 600.perlbench_s(peak)
=====

```

```

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
=====

```

```

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

```

```

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
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=====

```

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Compiler Version Notes (Continued)

C | 600.perlbench_s(peak)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 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++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 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 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

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

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Base Portability Flags (Continued)

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:

-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:

-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:

-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries

Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort



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Peak Portability Flags

```

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64(*) -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

```

(*) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:

```

600.perlbench_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

```

```

602.gcc_s: -m64 -qnextgen -std=c11 -fuse-ld=gold
-W1,-plugin-opt=-x86-branches-within-32B-boundaries
-W1,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

```

605.mcf_s: basepeak = yes

```

625.x264_s: -m64 -qnextgen -std=c11
-W1,-plugin-opt=-x86-branches-within-32B-boundaries
-W1,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

```

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

(Continued on next page)



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Peak Optimization Flags (Continued)

623.xalancbmk_s: basepeak = yes

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

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

http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.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-revH.xml>

http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.0 on 2020-09-03 10:58:36-0400.

Report generated on 2020-09-29 15:26:14 by CPU2017 PDF formatter v6255.

Originally published on 2020-09-29.