SPEC CPU®2017 Integer Speed Result

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ASUSTeK Computer Inc.

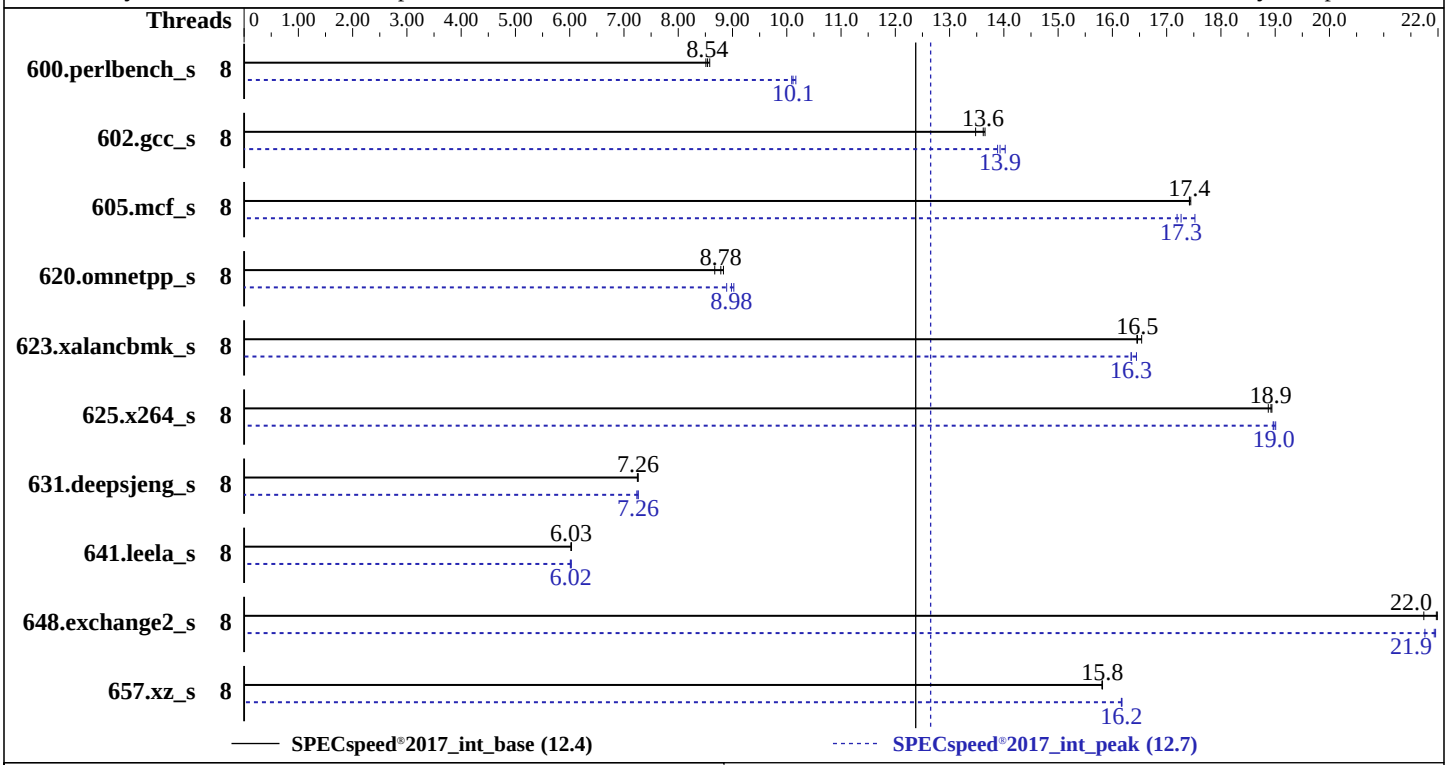
ASUS RS300-E10(P11C-C/4L) Server System
(3.40 GHz, Intel Xeon E-2278G)

SPECspeed®2017_int_base = 12.4

SPECspeed®2017_int_peak = 12.7

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: Nov-2019
Hardware Availability: Oct-2019
Software Availability: Sep-2019



Hardware

CPU Name: Intel Xeon E-2278G
Max MHz: 5000
Nominal: 3400
Enabled: 8 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 256 KB I+D on chip per core
L3: 16 MB I+D on chip per chip
Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
Storage: 1 x 1 TB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15
Kernel 4.12.14-150.17-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 3102 released Oct-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	8	**208**	**8.54**	207	8.58	209	8.51	8	**175**	**10.1**	176	10.1	175	10.2
602.gcc_s	8	295	13.5	292	13.7	**292**	**13.6**	8	**286**	**13.9**	287	13.9	284	14.0
605.mcf_s	8	**271**	**17.4**	271	17.4	271	17.4	8	269	17.5	275	17.2	**273**	**17.3**
620.omnetpp_s	8	185	8.83	**186**	**8.78**	188	8.67	8	181	9.02	**182**	**8.98**	183	8.89
623.xalancbmk_s	8	**86.1**	**16.5**	85.7	16.5	86.1	16.5	8	**86.7**	**16.3**	86.2	16.4	86.7	16.3
625.x264_s	8	93.5	18.9	**93.2**	**18.9**	93.1	18.9	8	93.0	19.0	92.8	19.0	**93.0**	**19.0**
631.deepsjeng_s	8	**197**	**7.26**	197	7.26	198	7.25	8	197	7.26	198	7.24	**197**	**7.26**
641.leela_s	8	283	6.03	**283**	**6.03**	283	6.02	8	**283**	**6.02**	284	6.01	283	6.03
648.exchange2_s	8	**134**	**22.0**	135	21.7	134	22.0	8	**134**	**21.9**	135	21.8	134	22.0
657.xz_s	8	391	15.8	391	15.8	**391**	**15.8**	8	382	16.2	**382**	**16.2**	382	16.2

SPECspeed®2017_int_base = 12.4

SPECspeed®2017_int_peak = 12.7

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"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/spec2017_110/lib/intel64:/spec2017_110/je5.0.1-64"
OMP_STACKSIZE = "192M"
```

General Notes

```
 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)
```

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General Notes (Continued)

```
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.
```

Platform Notes

```
BIOS Configuration:
Software Guard Extensions (SGX) = Disabled
AES = Disabled
VT-d = Disabled
HyperThreading = Disabled

 Sysinfo program /spec2017_110/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on linux-zeo2 Tue Nov 12 17:08:09 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) E-2278G CPU @ 3.40GHz
       1  "physical id"s (chips)
       8 "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 : 8
       siblings  : 8
       physical 0: cores 0 1 2 3 4 5 6 7

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      CPU(s):              8
      On-line CPU(s) list: 0-7
      Thread(s) per core:  1
      Core(s) per socket:  8
      Socket(s):           1
      NUMA node(s):        1
      Vendor ID:           GenuineIntel
      CPU family:          6
      Model:               158
      Model name:          Intel(R) Xeon(R) E-2278G CPU @ 3.40GHz
      Stepping:            13
      CPU MHz:             3400.000
```

(Continued on next page)

Platform Notes (Continued)

```
      CPU max MHz:           5000.0000
      CPU min MHz:           800.0000
      BogoMIPS:              6816.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              256K
      L3 cache:              16384K
      NUMA node0 CPU(s):     0-7
      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
      aperfmperf tsc_known_freq 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
      xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd
      ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase
      tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt
      intel_pt xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify
      hwp_act_window hwp_epp md_clear flush_l1d arch_capabilities

  /proc/cpuinfo cache data
     cache size : 16384 KB

  From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0 1 2 3 4 5 6 7
    node 0 size: 64044 MB
    node 0 free: 63499 MB
    node distances:
    node   0
      0:  10

  From /proc/meminfo
     MemTotal:       65581804 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

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

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Platform Notes (Continued)

```
      CPE_NAME="cpe:/o:suse:sles:15"

 uname -a:
    Linux linux-zeo2 4.12.14-150.17-default #1 SMP Thu May 2 15:15:46 UTC 2019 (bf13fb8)
    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 Nov 12 17:05

 SPEC is set to: /spec2017_110
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   929G   26G  904G   3% /

 From /sys/devices/virtual/dmi/id
     BIOS:    American Megatrends Inc. 3102 10/04/2019
     Vendor:  ASUSTeK COMPUTER INC.
     Product: P11C-C 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:
     4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 2666

 (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,
```

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Compiler Version Notes (Continued)

```
  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)
        | 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`

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Base Portability Flags (Continued)

657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -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-AVX2 -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

Fortran benchmarks:
-xCORE-AVX2 -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-AVX2 -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`

602.gcc_s: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2) `-O2 -xCORE-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4`

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Peak Optimization Flags (Continued)

Fortran benchmarks (continued):
-nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p11-V2.0-revB.2019-12-10.html
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p11-V2.0-revB.2019-12-10.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml

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