SPEC® CPU2017 Integer Speed Result

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ASUSTeK Computer Inc.

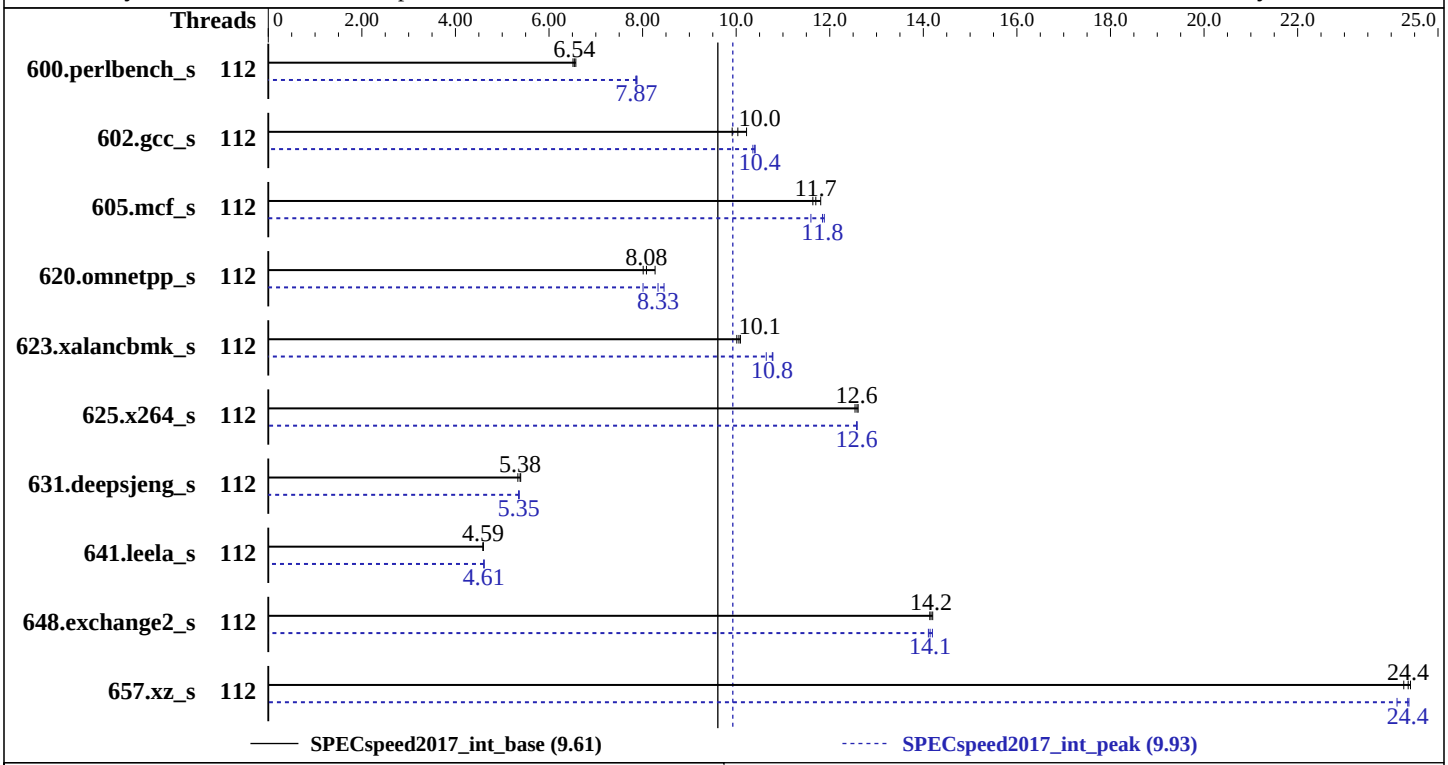
ASUS RS720Q-E9(Z11PH-D12) Server System
(2.10 GHz, Intel Xeon Platinum 8176)

SPECspeed2017_int_base = 9.61

SPECspeed2017_int_peak = 9.93

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

Test Date: Apr-2018
Hardware Availability: Feb-2018
Software Availability: Mar-2018



Hardware

CPU Name:	Intel Xeon Platinum 8176
Max MHz.:	3800
Nominal:	2100
Enabled:	56 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:	38.5 MB I+D on chip per chip
Other:	None
Memory:	384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)
Storage:	1 x 480 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 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 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	112	270	6.57	273	6.51	**271**	**6.54**	112	226	7.85	225	7.88	**225**	**7.87**
602.gcc_s	112	390	10.2	**397**	**10.0**	402	9.91	112	**383**	**10.4**	384	10.4	383	10.4
605.mcf_s	112	**403**	**11.7**	400	11.8	406	11.6	112	407	11.6	397	11.9	**399**	**11.8**
620.omnetpp_s	112	204	8.01	197	8.27	**202**	**8.08**	112	193	8.46	204	8.01	**196**	**8.33**
623.xalancbmk_s	112	140	10.1	142	10.0	**141**	**10.1**	112	133	10.6	**132**	**10.8**	131	10.8
625.x264_s	112	**140**	**12.6**	141	12.5	140	12.6	112	**140**	**12.6**	140	12.6	140	12.6
631.deepsjeng_s	112	**266**	**5.38**	266	5.39	269	5.33	112	**268**	**5.35**	267	5.36	268	5.35
641.leela_s	112	**371**	**4.59**	372	4.59	371	4.59	112	**370**	**4.61**	370	4.61	370	4.61
648.exchange2_s	112	**208**	**14.2**	208	14.1	207	14.2	112	208	14.1	**208**	**14.1**	207	14.2
657.xz_s	112	253	24.4	255	24.3	**254**	**24.4**	112	256	24.1	254	24.4	**254**	**24.4**

SPECspeed2017_int_base = 9.61

SPECspeed2017_int_peak = 9.93

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 avilable 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.
```

Platform Notes

```
BIOS Configuration:
SNC = Disabled
IMC interleaving = AUTO
Patrol Scrub = Disabled
VT-d = Disabled
HyperThreading = Disabled
 Sysinfo program /spec2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-pmm5 Thu Apr 12 05:07:04 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) Platinum 8176 CPU @ 2.10GHz
       2  "physical id"s (chips)
       56 "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 : 28
       siblings  : 28
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                56
      On-line CPU(s) list:   0-55
      Thread(s) per core:    1
      Core(s) per socket:    28
      Socket(s):             2
      NUMA node(s):          2
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Platinum 8176 CPU @ 2.10GHz
      Stepping:              4
      CPU MHz:               2101.000
      CPU max MHz:           2101.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              4326.12
      Virtualization:        VT-x
```

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Platform Notes (Continued)

```
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              39424K
      NUMA node0 CPU(s):     0-27
      NUMA node1 CPU(s):     28-55
      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
      aperfmperf eagerfpu 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 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 : 39424 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 20 21 22 23 24 25 26 27
    node 0 size: 192065 MB
    node 0 free: 189836 MB
    node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
    53 54 55
    node 1 size: 193515 MB
    node 1 free: 192033 MB
    node distances:
    node   0   1
      0:  10  21
      1:  21  10

  From /proc/meminfo
     MemTotal:       394834580 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.
```

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Platform Notes (Continued)

```
    os-release:
       NAME="SLES"
       VERSION="12-SP3"
       VERSION_ID="12.3"
       PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
       ID="sles"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/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

 run-level 3 Apr 11 15:43

 SPEC is set to: /spec2017
    Filesystem     Type   Size  Used Avail Use% Mounted on
    /dev/sdc2      btrfs  426G   29G  397G   7% /

 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 Samsung M393A4K40BB2-CTD 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) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC   600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
 CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
      641.leela_s(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak)
     641.leela_s(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  648.exchange2_s(base, peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 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`

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Base Portability Flags (Continued)

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
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64

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Peak Portability Flags (Continued)

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

623.xalancbmk_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/je5.0.1-32/lib -ljemalloc

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Peak Optimization Flags (Continued)

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: Same as 620.omnetpp_s

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

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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