SPEC CPU®2017 Integer Speed Result

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Supermicro

SuperServer 5019C-WR (X11SCW-F , Intel Xeon E-2278G)

$SPECspeed^{®}2017\_int\_base = 11.8$

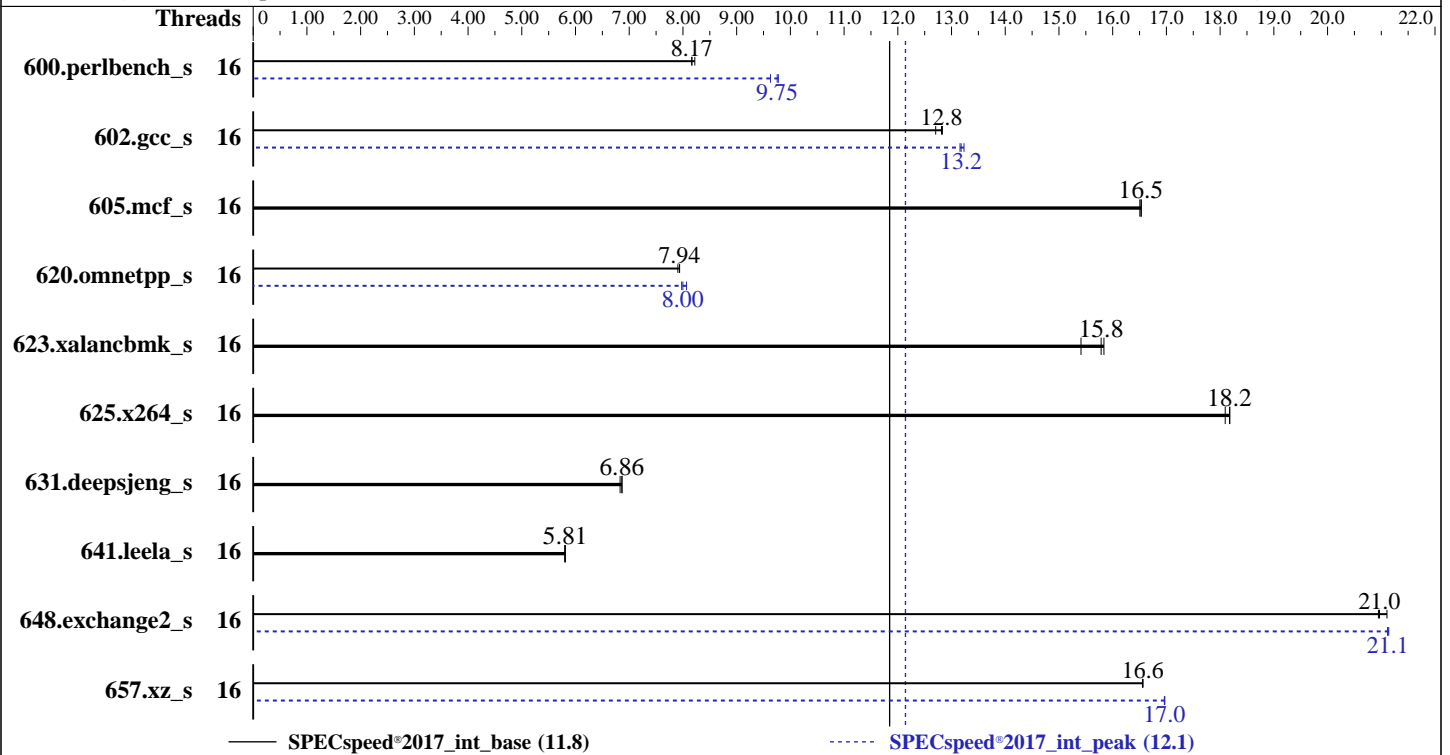$SPECspeed^{®}2017\_int\_peak = 12.1$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2019

Hardware Availability: May-2019

Software Availability: Jun-2019

Threads

Benchmark	Threads	base	peak
600.perlbench_s	16	8.17	9.75
602.gcc_s	16	12.8	13.2
605.mcf_s	16	16.5	
620.omnetpp_s	16	7.94	8.00
623.xalancbmk_s	16	15.8	
625.x264_s	16	18.2	
631.deepsjeng_s	16	6.86	
641.leela_s	16	5.81	
648.exchange2_s	16	21.0	21.1
657.xz_s	16	16.6	17.0

SPECspeed®2017_int_base (11.8)   SPECspeed®2017_int_peak (12.1)

Hardware

CPU Name: Intel Xeon E-2278G
 Max MHz: 5000
 Nominal: 3400
Enabled: 8 cores, 1 chip, 2 threads/core
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 200 GB SATA III SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP1 (x86_64)
Kernel 4.12.14-195-default
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++
Compiler for Linux;
Fortran: Version 19.0.4.227 of Intel Fortran
Compiler for Linux
Parallel: Yes
Firmware: Version 1.0b released May-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: --

Standard Performance Evaluation Corporation (info@spec.org)

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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	16	**217**	**8.17**	216	8.22	217	8.16	16	184	9.63	182	9.78	**182**	**9.75**
602.gcc_s	16	310	12.8	**311**	**12.8**	313	12.7	16	303	13.2	301	13.2	**302**	**13.2**
605.mcf_s	16	286	16.5	**286**	**16.5**	286	16.5	16	286	16.5	**286**	**16.5**	286	16.5
620.omnetpp_s	16	**206**	**7.94**	206	7.91	205	7.94	16	**204**	**8.00**	202	8.07	205	7.98
623.xalancbmk_s	16	**89.8**	**15.8**	89.5	15.8	92.0	15.4	16	**89.8**	**15.8**	89.5	15.8	92.0	15.4
625.x264_s	16	97.0	18.2	**97.1**	**18.2**	97.5	18.1	16	97.0	18.2	**97.1**	**18.2**	97.5	18.1
631.deepsjeng_s	16	**209**	**6.86**	210	6.83	209	6.87	16	**209**	**6.86**	210	6.83	209	6.87
641.leela_s	16	294	5.81	294	5.80	**294**	**5.81**	16	294	5.81	294	5.80	**294**	**5.81**
648.exchange2_s	16	139	21.1	**140**	**21.0**	140	20.9	16	139	21.1	139	21.1	**139**	**21.1**
657.xz_s	16	**373**	**16.6**	373	16.6	373	16.6	16	364	17.0	**364**	**17.0**	364	17.0
SPECspeed®2017_int_base =		**11.8**												
SPECspeed®2017_int_peak =		**12.1**												

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 = "/home/cpu2017/lib/intel64:/home/cpu2017/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

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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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General Notes (Continued)

sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

Platform Notes

```
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on 135-172-176 Sun Nov 10 00:11:23 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)
      16 "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  : 16
      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
     Address sizes:       39 bits physical, 48 bits virtual
     CPU(s):              16
     On-line CPU(s) list: 0-15
     Thread(s) per core:  2
     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
     CPU max MHz:         5000.0000
     CPU min MHz:         800.0000
     BogoMIPS:            6816.00
     Virtualization:      VT-x
     L1d cache:           32K
     L1i cache:           32K
```

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Platform Notes (Continued)

```
      L2 cache:             256K
      L3 cache:             16384K
      NUMA node0 CPU(s):    0-15
      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
   aes 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 8 9 10 11 12 13 14 15
    node 0 size: 64315 MB
    node 0 free: 41570 MB
    node distances:
    node   0
      0:  10

 From /proc/meminfo
    MemTotal:       65858988 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 135-172-176 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
    x86_64 x86_64 x86_64 GNU/Linux
```

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SPECspeed®2017_int_base = 11.8

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Platform Notes (Continued)

```
  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 6 11:31

  SPEC is set to: /home/cpu2017
     Filesystem      Type  Size  Used Avail Use% Mounted on
     /dev/sda3       xfs   175G   21G  154G  12% /home


  From /sys/devices/virtual/dmi/id
      BIOS:    American Megatrends Inc. 1.0b 05/16/2019
      Vendor:  Supermicro
      Product: Super Server
      Serial:  0123456789


  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 Micron 18ADF2G72AZ-2G6H1R 16 GB 2 rank 2667


  (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,
  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)
```

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Compiler Version Notes (Continued)

```
-----------------------------------------------------------------------
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`
657.xz_s: `-DSPEC_LP64`

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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
```

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Peak Optimization Flags (Continued)

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: basepeak = yes

625.x264_s: basepeak = yes

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: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html
http://www.spec.org/cpu2017/flags/Default-Platform-Flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml
http://www.spec.org/cpu2017/flags/Default-Platform-Flags.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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