SPEC CPU®2017 Integer Speed Result

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ASUSTeK Computer Inc.

ASUS ESC8000 G4(Z11PG-D24) Server System
(3.60 GHz, Intel Xeon Gold 6244)

$SPECspeed^{®}2017\_int\_base = 11.5$
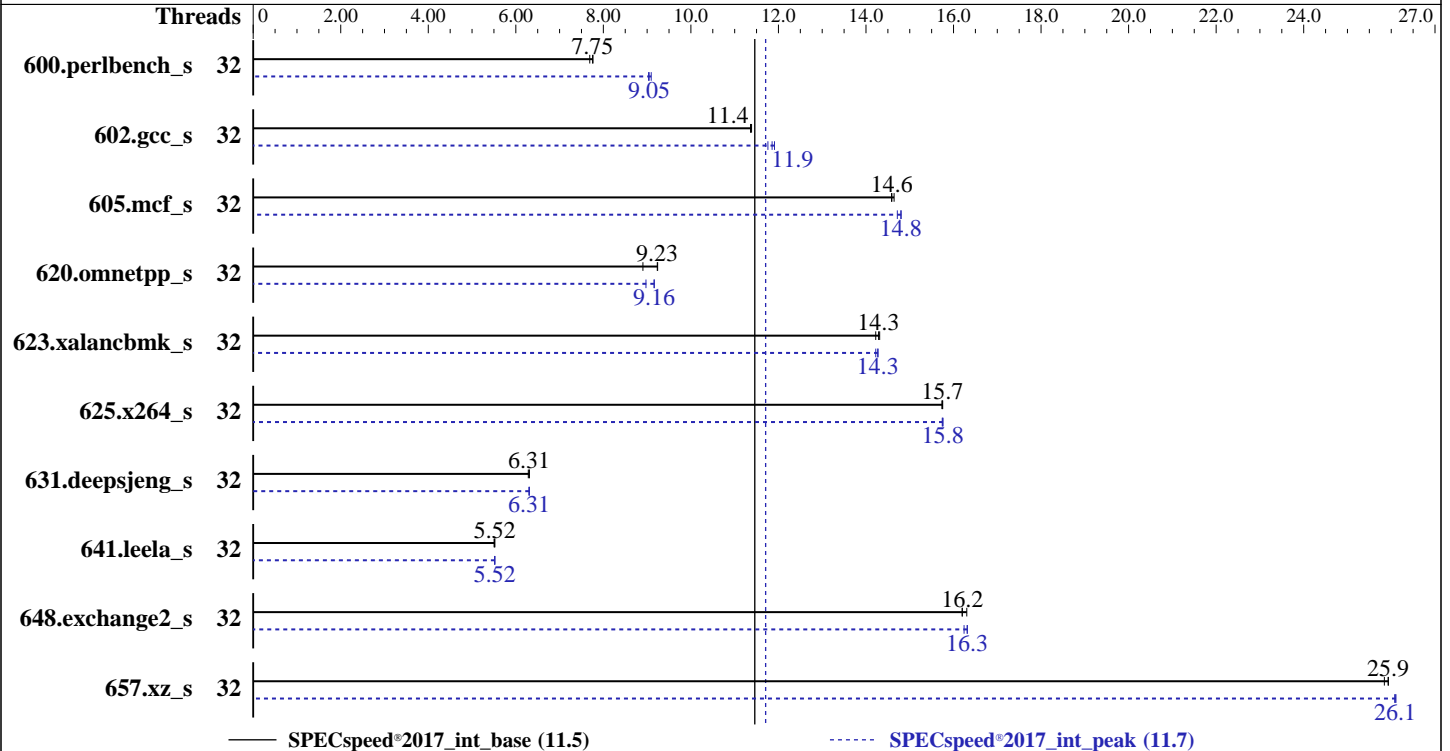
$SPECspeed^{®}2017\_int\_peak = 11.7$

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

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Threads

Benchmark	Threads	base	peak
600.perlbench_s	32	7.75	9.05
602.gcc_s	32	11.4	11.9
605.mcf_s	32	14.6	14.8
620.omnetpp_s	32	9.23	9.16
623.xalancbmk_s	32	14.3	14.3
625.x264_s	32	15.7	15.8
631.deepsjeng_s	32	6.31	6.31
641.leela_s	32	5.52	5.52
648.exchange2_s	32	16.2	16.3
657.xz_s	32	25.9	26.1

—— SPECspeed®2017_int_base (11.5)   - - - - SPECspeed®2017_int_peak (11.7)

Hardware

CPU Name: Intel Xeon Gold 6244
 Max MHz: 4400
 Nominal: 3600
Enabled: 16 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 24.75 MB I+D on chip per chip
 Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 1TB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15
 Kernel 4.12.14-23-default
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
 Compiler Build 20181018 for Linux;
 Fortran: Version 19.0.1.144 of Intel Fortran
 Compiler Build 20181018 for Linux
Parallel: Yes
Firmware: Version 5102 released Feb-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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SPECspeed®2017_int_base = 11.5

SPECspeed®2017_int_peak = 11.7

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	32	231	7.69	**229**	**7.75**	229	7.76	32	197	9.03	**196**	**9.05**	195	9.09
602.gcc_s	32	350	11.4	**350**	**11.4**	350	11.4	32	334	11.9	**336**	**11.9**	339	11.8
605.mcf_s	32	322	14.6	**324**	**14.6**	324	14.6	32	321	14.7	319	14.8	**319**	**14.8**
620.omnetpp_s	32	183	8.90	**177**	**9.23**	177	9.24	32	182	8.97	**178**	**9.16**	178	9.16
623.xalancbmk_s	32	**99.2**	**14.3**	99.0	14.3	99.6	14.2	32	**99.3**	**14.3**	99.6	14.2	99.3	14.3
625.x264_s	32	112	15.7	112	15.8	**112**	**15.7**	32	112	15.7	112	15.8	**112**	**15.8**
631.deepsjeng_s	32	228	6.28	227	6.31	**227**	**6.31**	32	**227**	**6.31**	227	6.31	227	6.30
641.leela_s	32	309	5.52	310	5.50	**309**	**5.52**	32	**309**	**5.52**	309	5.51	309	5.52
648.exchange2_s	32	180	16.3	**181**	**16.2**	182	16.2	32	180	16.3	**180**	**16.3**	181	16.2
657.xz_s	32	238	25.9	239	25.8	**238**	**25.9**	32	237	26.1	237	26.1	**237**	**26.1**
SPECspeed®2017_int_base =		**11.5**												
SPECspeed®2017_int_peak =		**11.7**												

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"
```

General Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/spec2017_2019u1/lib/ia32:/spec2017_2019u1/lib/intel64:
/spec2017_2019u1/je5.0.1-32:/spec2017_2019u1/je5.0.1-64"
OMP_STACKSIZE = "192M"
 Binaries compiled on a system with 1x Intel Core i9-7900X 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)
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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$SPECspeed^{®}2017\_int\_base = 11.5$

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CPU2017 License:	9016	**Test Date:**	Apr-2019
Test Sponsor:	ASUSTeK Computer Inc.	**Hardware Availability:**	Apr-2019
Tested by:	ASUSTeK Computer Inc.	**Software Availability:**	Nov-2018

Platform Notes

```
BIOS Configuration:
VT-d = Disabled
Patrol Scrub = Disabled
ENERGY_PERF_BIAS_CFG mode = performance
CSM Support = Disabled
Engine Boost = Level3(Max)
Enforce POR = Disable
Memory Frequency = 2933
LLC dead line allc = Disabled
SR-IOV Support = Disabled
 Sysinfo program /spec2017/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-gh78 Tue Apr 30 16:43:41 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) Gold 6244 CPU @ 3.60GHz
       2  "physical id"s (chips)
       32 "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 2 3 11 17 20 24 25 27
       physical 1: cores 2 3 4 16 17 20 24 27

 From lscpu:
       Architecture:        x86_64
       CPU op-mode(s):      32-bit, 64-bit
       Byte Order:          Little Endian
       CPU(s):              32
       On-line CPU(s) list: 0-31
       Thread(s) per core:  2
       Core(s) per socket:  8
       Socket(s):           2
       NUMA node(s):        2
       Vendor ID:           GenuineIntel
       CPU family:          6
       Model:               85
       Model name:          Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz
       Stepping:            7
       CPU MHz:             3600.000
       CPU max MHz:         4400.0000
       CPU min MHz:         1200.0000
```

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CPU2017 License:	9016	**Test Date:**	Apr-2019
Test Sponsor:	ASUSTeK Computer Inc.	**Hardware Availability:**	Apr-2019
Tested by:	ASUSTeK Computer Inc.	**Software Availability:**	Nov-2018

Platform Notes (Continued)

```
        BogoMIPS:               7200.00
        Virtualization:         VT-x
        L1d cache:              32K
        L1i cache:              32K
        L2 cache:               1024K
        L3 cache:               25344K
        NUMA node0 CPU(s):      0-7,16-23
        NUMA node1 CPU(s):      8-15,24-31
        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 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 mba 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 ibpb ibrs stibp
    dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
    arch_capabilities ssbd

 /proc/cpuinfo cache data
    cache size : 25344 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 16 17 18 19 20 21 22 23
   node 0 size: 385568 MB
   node 0 free: 385050 MB
   node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
   node 1 size: 386994 MB
   node 1 free: 386355 MB
   node distances:
   node   0   1
     0:  10  21
     1:  21  10

 From /proc/meminfo
    MemTotal:       791104052 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    os-release:
       NAME="SLES"
       VERSION="15"
```

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CPU2017 License: 9016
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Test Date: Apr-2019
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Platform Notes (Continued)

```
      VERSION_ID="15"
      PRETTY_NAME="SUSE Linux Enterprise Server 15"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15"

 uname -a:
    Linux linux-gh78 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
    x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2017-5754 (Meltdown):            Not affected
 CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation,
 IBPB, IBRS_FW

 run-level 3 Apr 30 16:42

 SPEC is set to: /spec2017
    Filesystem       Type  Size  Used Avail Use% Mounted on
    /dev/sda4        xfs   929G  9.9G  919G   2% /

 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. 5102 02/11/2019
   Memory:
    24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

 (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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
```

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CPU2017 License: 9016
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Tested by: ASUSTeK Computer Inc.

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Compiler Version Notes (Continued)

```
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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 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-AVX512 -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-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc
```

Fortran benchmarks:
```
-xCORE-AVX512 -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-AVX512 -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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Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

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Peak Optimization Flags (Continued)

602.gcc_s: `-Wl,-z,muldefs` `-prof-gen`(pass 1) `-prof-use`(pass 2) `-O2`
`-xCORE-AVX512` `-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-AVX512` `-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-AVX512` `-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-AVX512` `-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-AVX512` `-O3` `-no-prec-div` `-qopt-mem-layout-trans=4`
`-DSPEC_SUPPRESS_OPENMP`
`-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64`
`-lqkmalloc`

623.xalancbmk_s: `-Wl,-z,muldefs` `-xCORE-AVX512` `-ipo` `-O3` `-no-prec-div`
`-qopt-mem-layout-trans=4`
`-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64`
`-lqkmalloc`

631.deepsjeng_s: `Same as 623.xalancbmk_s`

641.leela_s: `Same as 623.xalancbmk_s`

Fortran benchmarks:
`-xCORE-AVX512` `-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/ASUSTekPlatform-Settings-z11-V2.0-revD.html
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.html

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Tested by: ASUSTeK Computer Inc.　　　　　　　　　　　　　**Software Availability:** Nov-2018

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-linux64.2019-04-02.xml

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

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