## SPEC® CPU2017 Integer Speed Result

**ASUSTeK Computer Inc.**

ASUS RS300-E10(P11C-C/4L) Server System
(3.50 GHz, Intel Xeon E-2146G)

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

### Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>perlbench_s</th>
<th>gcc_s</th>
<th>mcf_s</th>
<th>omnetpp_s</th>
<th>xalancbmk_s</th>
<th>x264_s</th>
<th>deepsjeng_s</th>
<th>leela_s</th>
<th>exchange2_s</th>
<th>xz_s</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>7.51</td>
<td>8.96</td>
<td>12.0</td>
<td>12.4</td>
<td>15.5</td>
<td>14.8</td>
<td>6.53</td>
<td>5.40</td>
<td>16.1</td>
<td>14.0</td>
</tr>
</tbody>
</table>

**SPECspeed2017_int_base** = 10.8  
**SPECspeed2017_int_peak** = 11.0

### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>SUSE Linux Enterprise Server 12 (x86_64) SP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 19.0.1.144 of Intel C/C++</td>
</tr>
<tr>
<td></td>
<td>Compiler Build 20181018 for Linux;</td>
</tr>
<tr>
<td></td>
<td>Fortran: Version 19.0.1.144 of Intel Fortran</td>
</tr>
<tr>
<td></td>
<td>Compiler Build 20181018 for Linux;</td>
</tr>
<tr>
<td>Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware:</td>
<td>Version 0502 released Nov-2018</td>
</tr>
<tr>
<td>File System:</td>
<td>btrfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other:</td>
<td>jemalloc: jemalloc memory allocator library V5.0.1</td>
</tr>
</tbody>
</table>

### CPU Details

- **CPU Name:** Intel Xeon E-2146G  
- **Max MHz.:** 4500  
- **Nominal:** 3500  
- **Enabled:** 6 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:** 12 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)  
- **Storage:** 1 x 500 GB SATA HDD, 7200RPM  
- **Other:** None
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>12</td>
<td>239</td>
<td>7.42</td>
<td>235</td>
<td>7.54</td>
<td>236</td>
<td>7.51</td>
<td>12</td>
<td>199</td>
<td>8.93</td>
<td>198</td>
<td>8.96</td>
<td>198</td>
<td>8.96</td>
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<tr>
<td>602.gcc_s</td>
<td>12</td>
<td>335</td>
<td>11.9</td>
<td>333</td>
<td>12.0</td>
<td>333</td>
<td>12.0</td>
<td>12</td>
<td>322</td>
<td>12.4</td>
<td>321</td>
<td>12.4</td>
<td>322</td>
<td>12.4</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>12</td>
<td>300</td>
<td>15.7</td>
<td>304</td>
<td>15.5</td>
<td>305</td>
<td>15.5</td>
<td>12</td>
<td>300</td>
<td>15.7</td>
<td>300</td>
<td>15.7</td>
<td>305</td>
<td>15.5</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>12</td>
<td>214</td>
<td>7.63</td>
<td>213</td>
<td>7.65</td>
<td>215</td>
<td>7.60</td>
<td>12</td>
<td>212</td>
<td>7.68</td>
<td>212</td>
<td>7.69</td>
<td>214</td>
<td>7.62</td>
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<td>623.xalanchmk_s</td>
<td>12</td>
<td>95.8</td>
<td>14.8</td>
<td>95.0</td>
<td>14.9</td>
<td>96.2</td>
<td>14.7</td>
<td>12</td>
<td>96.8</td>
<td>14.6</td>
<td>95.6</td>
<td>14.8</td>
<td>97.0</td>
<td>14.6</td>
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<tr>
<td>625.x264_s</td>
<td>12</td>
<td>104</td>
<td>17.0</td>
<td>104</td>
<td>17.0</td>
<td>104</td>
<td>17.0</td>
<td>12</td>
<td>104</td>
<td>17.0</td>
<td>104</td>
<td>17.0</td>
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<td>17.0</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>12</td>
<td>220</td>
<td>6.50</td>
<td>220</td>
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<td>220</td>
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<td>12</td>
<td>221</td>
<td>6.48</td>
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<td>6.49</td>
<td>219</td>
<td>6.54</td>
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<tr>
<td>641.leela_s</td>
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<td>5.41</td>
<td>316</td>
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<td>316</td>
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<td>12</td>
<td>319</td>
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<td>5.36</td>
<td>314</td>
<td>5.43</td>
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<tr>
<td>657.xz_s</td>
<td>12</td>
<td>450</td>
<td>13.7</td>
<td>451</td>
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<td>451</td>
<td>13.7</td>
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<td>442</td>
<td>14.0</td>
<td>442</td>
<td>14.0</td>
<td>442</td>
<td>14.0</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base = 10.8  
SPECspeed2017_int_peak = 11.0

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_new/lib/ia32:/spec2017_new/lib/intel64:
/spec2017_new/je5.0.1-32:/spec2017_new/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
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.
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Test Sponsor: ASUSTeK Computer Inc.
Test Date: May-2019
Tested by: ASUSTeK Computer Inc.
Hardware Availability: Dec-2018
Software Availability: Nov-2018

BIOS Configuration:
VT-d = Disabled
AES = Disabled
Sysinfo program /spec2017_new/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f29999c33d61f64985e458859ea9
running on linux-pmm5 Wed May 8 14:48:47 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-2146G CPU @ 3.50GHz
  1 "physical id"s (chips)
  12 "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 : 6
siblings : 12
physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                12
On-line CPU(s) list:   0-11
Thread(s) per core:    2
Core(s) per socket:    6
Socket(s):             1
NUMA node(s):          1
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 158
Model name:            Intel(R) Xeon(R) E-2146G CPU @ 3.50GHz
Stepping:              10
CPU MHz:               4311.997
CPU max MHz:           4500.0000
CPU min MHz:           800.0000
BogoMIPS:              7007.97
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              256K
L3 cache:              12288K
NUMA node0 CPU(s):     0-11
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)
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Platform Notes (Continued)

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 nobl xtopology nonstop_tsc  
aperfmpref eagerfpu pni pclmulqdq dtse64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg  
fma cx16 xpr fcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer xsave  
avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts dtherm  
hwp hwp_notify hwp_act_window hwp_epp intel_pt rsb_cxsw spec_ctrl stibp retperline  
kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep  
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1

/proc/cpuinfo cache data
  cache size : 12288 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
  node 0 size: 64313 MB
  node 0 free: 63789 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65857384 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.
  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

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Platform Notes (Continued)

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 May 8 14:45

SPEC is set to: /spec2017_new

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 445G 129G 315G 30% /

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. 0502 11/15/2018
Memory:
4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 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)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

==============================================================================
CC   600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 625.x264_s(peak) 657.xz_s(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.
------------------------------------------------------------------------------

==============================================================================
CXXC 620.omnetpp_s(base) 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,
ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
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CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
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Compiler Version Notes (Continued)

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

==============================================================================
CXXC 620.omnetpp_s(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.

==============================================================================
FC  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-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_2019.1.144/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`

(Continued on next page)
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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: -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 -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_2019.1.144/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_2019.1.144/linux/compiler/lib/intel64  
-lqkmalloc

631.deepsjeng_s: Same as 623.xalancbmk_s

641.leela_s: Same as 623.xalancbmk_s

### Fortran benchmarks:

-xCORE-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

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You can also download the XML flags sources by saving the following links:


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

Tested with SPEC CPU2017 v1.0.5 on 2019-05-08 02:48:47-0400.  
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