ASUSTeK Computer Inc.  
ASUS ESC8000 G4(Z11PG-D24) Server System  
(2.40 GHz, Intel Xeon Silver 4214R)

**SPEC CPU®2017 Integer Speed Result**

Copyright 2017-2020 Standard Performance Evaluation Corporation

**SPECspeed®2017_int_base = 9.01**

**SPECspeed®2017_int_peak = 9.14**

<table>
<thead>
<tr>
<th>Software Availability:</th>
<th>Jun-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Date:</strong></td>
<td>May-2020</td>
</tr>
<tr>
<td><strong>CPU2017 License:</strong></td>
<td>9016</td>
</tr>
<tr>
<td><strong>Test Sponsor:</strong></td>
<td>ASUSTeK Computer Inc.</td>
</tr>
<tr>
<td><strong>Hardware Availability:</strong></td>
<td>Feb-2020</td>
</tr>
<tr>
<td><strong>Tested by:</strong></td>
<td>ASUSTeK Computer Inc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong> Intel Xeon Silver 4214R</td>
</tr>
<tr>
<td><strong>Max MHz:</strong> 3500</td>
</tr>
<tr>
<td><strong>Nominal:</strong> 2400</td>
</tr>
<tr>
<td><strong>Enabled:</strong> 24 cores, 2 chips</td>
</tr>
<tr>
<td><strong>Orderable:</strong> 1, 2 chip(s)</td>
</tr>
<tr>
<td><strong>Cache L1:</strong> 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>L2:</strong> 1 MB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3:</strong> 16.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
</tr>
<tr>
<td><strong>Memory:</strong> 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)</td>
</tr>
<tr>
<td><strong>Storage:</strong> 1 x 1 TB SATA SSD</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OS:</strong> SUSE Linux Enterprise Server 15 SP1</td>
</tr>
<tr>
<td><strong>Kernel:</strong> 4.12.14-195-default</td>
</tr>
<tr>
<td><strong>Compiler:</strong> 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</td>
</tr>
<tr>
<td><strong>Parallel:</strong> Yes</td>
</tr>
<tr>
<td><strong>Firmware:</strong> Version 6102 released Dec-2019</td>
</tr>
<tr>
<td><strong>File System:</strong> xfs</td>
</tr>
<tr>
<td><strong>System State:</strong> Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Base Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td><strong>Other:</strong> jemalloc: jemalloc memory allocator library V5.0.1</td>
</tr>
<tr>
<td><strong>Power Management:</strong> BIOS and OS set to prefer performance at the cost of additional power usage</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (9.01)</th>
<th>SPECspeed®2017_int_peak (9.14)</th>
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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>6.82</td>
<td>9.05</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>9.09</td>
<td>11.8</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>6.49</td>
<td>11.2</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>5.08</td>
<td>12.2</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>4.22</td>
<td>14.4</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>20.4</td>
<td>14.4</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>24</td>
<td>20.4</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>24</td>
<td></td>
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</table>

**CPU2017 License:** 9016

**Test Sponsor:** ASUSTeK Computer Inc.

**Hardware Availability:** Feb-2020

**Tested by:** ASUSTeK Computer Inc.

**Software Availability:** Jun-2019
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>
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<tr>
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<td>5.97</td>
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<td>5.95</td>
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<td>251</td>
<td>6.50</td>
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<td>11.1</td>
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<td>11.2</td>
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<td>127</td>
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<td>128</td>
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<td>5.08</td>
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<td>5.07</td>
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<td>641.leela_s</td>
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<td>4.22</td>
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<tr>
<td>648.exchange2_s</td>
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<td>20.4</td>
<td>304</td>
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<td>24</td>
<td>303</td>
<td>20.4</td>
<td>303</td>
<td>20.4</td>
<td>304</td>
<td>20.4</td>
</tr>
</tbody>
</table>

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"
OS set to performance mode via cpupower frequency-set -g performance

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/19u4/lib/intel64:/19u4/je5.0.1-64"
OMP_STACKSIZE = "192M"

General Notes

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
Files	system 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.
The jemalloc library was

(Continued on next page)
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SPECspeed®2017_int_base = 9.01
SPECspeed®2017_int_peak = 9.14

General Notes (Continued)

configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
built with the RedHat Enterprise 7.5,
and the system compiler gcc 4.8.5;
sources available from jemalloc.net or

Platform Notes

BIOS Configuration:
Patrol Scrub = Disabled
VT-d = Disabled
HyperThreading = Disabled
ENERGY_PERF_BIAS_CFG mode = performance
CSM Support = Disabled
Engine Boost = Level3(Max)
LLC dead line allc = Disabled
SR-IOV Support = Disabled
Sysinfo program /19u4/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed6b1e646a485a0011
running on linux-628j Tue May 12 05:22:35 2020

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) Silver 4214R CPU @ 2.40GHz
  2  "physical id"s (chips)
  24 "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 : 12
siblings : 12
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1

(Continued on next page)
Platform Notes (Continued)

Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4214R CPU @ 2.40GHz
Stepping: 7
CPU MHz: 2400.000
CPU max MHz: 3500.000
CPU min MHz: 1000.000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0-11
NUMA node1 CPU(s): 12-23
Flags: fpu vme de pse tsc msr pae mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf 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 intel_ppln ssbd mba ibrs ibpb stibp ibrs_enhanced 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 xSAVEAT xsaves cqm_llc cqm_occap_l1c cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size: 16896 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
  node 0 size: 385616 MB
  node 0 free: 382968 MB
  node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
  node 1 size: 387039 MB
  node 1 free: 386619 MB
  node distances:
    node 0  1
      0:  10  21

(Continued on next page)
SPEC CPU® 2017 Integer Speed Result

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**Platform Notes (Continued)**

1: 21 10

From /proc/meminfo
MemTotal: 791199472 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 linux-628j 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
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 May 11 19:26

SPEC is set to: /19u4

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 6102 12/19/2019
Vendor: ASUSTeK COMPUTER INC.
Product: Z11PG-D24 Series
Product Family: Server
Serial: System Serial Number

Additional information from dmidecode follows. WARNING: Use caution when you interpret

(Continued on next page)
Platform Notes (Continued)

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:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(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)
------------------------------------------------------------------------------
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

(Continued on next page)
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Base Compiler Invocation (Continued)

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

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
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/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

(Continued on next page)
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Peak Compiler Invocation (Continued)

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 -gopenmp
-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=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: -Wl, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

657.xz_s: basepeak = yes

C++ benchmarks:
620.omnetpp_s: basepeak = yes

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_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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Peak Optimization Flags (Continued)

631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes

Fortran benchmarks:
648.exchange2_s: basepeak = yes

The flags files that were used to format this result can be browsed at

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

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