ASUSTeK Computer Inc.  
ASUS RS720-E11(Z13PP-D32) Server System (2.00 GHz, Intel Xeon Platinum 8480+)

| SPECspeed®2017_int_base = 14.7 | SPECspeed®2017_int_peak = 15.0 |

CPU 2017 License: 9016  
Test Sponsor: ASUSTeK Computer Inc.  
Tested by: ASUSTeK Computer Inc.  

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</table>

Hardware

| CPU Name: Intel Xeon Platinum 8480+ |
| Max MHz: 3800 |
| Nominal: 2000 |
| Enabled: 112 cores, 2 chips |
| Orderable: 1, 2 chip(s) |
| Cache L1: 32 KB I + 48 KB D on chip per core |
| L2: 2 MB I+D on chip per core |
| L3: 105 MB I+D on chip per chip |
| Other: None |
| Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R) |
| Storage: 1 x 1.6 TB PCIE NVME SSD |
| Other: None |

Software

| OS: SUSE Linux Enterprise Server 15 SP4 (x86_64) |
| Kernel 5.14.21-150400.22-default |
| Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2022.1 of Intel Fortran Compiler for Linux; |
| Parallel: Yes |
| Firmware: Version 0401 released Nov-2022 |
| 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: BIOS and OS set to prefer performance at the cost of additional power usage. |
SPEC CPU®2017 Integer Speed Result

ASUSTeK Computer Inc.
ASUS RS720-E11(Z13PP-D32) Server System
(2.00 GHz, Intel Xeon Platinum 8480+)

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ASUSTeK Computer Inc.
(2.00 GHz, Intel Xeon Platinum 8480+)
ASUS RS720-E11(Z13PP-D32) Server System

SPECspeed®2017_int_base = 14.7
SPECspeed®2017_int_peak = 15.0

Results Table

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</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalanchmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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 = "/spec2017/lib/intel64:/spec2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
SPEC CPU®2017 Integer Speed Result

ASUStek Computer Inc.
ASUS RS720-E11(Z13PP-D32) Server System
(2.00 GHz, Intel Xeon Platinum 8480+)

SPECspeed®2017_int_base = 14.7
SPECspeed®2017_int_peak = 15.0

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

Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

General Notes (Continued)

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

Platform Notes

BIOS Configuration:
VT-d = Disabled
Patrol Scrub = Disabled
Hyper-Threading = Disable
Engine Boost = Aggressive
SR-IOV Support = Disabled
SNC = Enable SNC2 (2-clusters)

BBMC Configuration:
Fan mode = Full speed mode

Sysinfo program /spec2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d64d
running on localhost Thu Dec 1 20:52:25 2022

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 8480+
  2 "physical id"s (chips)
  112 "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 : 56
siblings : 56
physical 0: cores 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 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
physical 1: cores 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 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

From lscpu from util-linux 2.37.2:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 112
On-line CPU(s) list: 0-111
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Platinum 8480+
CPU family: 6
Model: 143

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

**ASUSTeK Computer Inc.**
ASUS RS720-E11(Z13PP-D32) Server System
(2.00 GHz, Intel Xeon Platinum 8480+)

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<th>Test Date: Dec-2022</th>
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<td>Software Availability: Jun-2022</td>
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**SPECspeed®2017_int_base = 14.7**

**SPECspeed®2017_int_peak = 15.0**

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**Platform Notes (Continued)**

- Thread(s) per core: 1
- Core(s) per socket: 56
- Socket(s): 2
- Stepping: 8
- CPU max MHz: 3800.0000
- CPU min MHz: 800.0000
- BogoMIPS: 4000.00
- Flags: fpu vme de pse mce cx8 apic sep mtrr
  - pge mca cmov pat pse36 cflflush 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 aperf perfec 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 3nowprefetch cpuid_fault
  - ebт l3 l1d l1i cdpl cdp l1d wp spec nonstop tg aes xsave cmp stmx clflush
class Vk xsavecledes pfemkipdav

- Virtualization: VT-x
- NUMA node(s): 4
- NUMA node0 CPU(s): 0-27
- NUMA node1 CPU(s): 28-55
- NUMA node2 CPU(s): 56-83
- NUMA node3 CPU(s): 84-111
- Vulnerability L1lb multihit: Not affected
- Vulnerability L1tf: Not affected
- Vulnerability Mds: Not affected
- Vulnerability Meltdown: Not affected
- Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
  - prctl and seccomp
  - Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user
  - pointer sanitization
  - Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB
  - filling
  - Vulnerability Srbds: Not affected
  - Vulnerability Txs async abort: Not affected

---

From /proc/cpuinfo cache data

```
/proc/cpupinfo cache data
cache size : 107520 KB
```

From numactl --hardware

```
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
nodem 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
```

(Claude on next page)
Platform Notes ( Continued )

node 0 size: 257682 MB
node 0 free: 256810 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: 258040 MB
node 1 free: 256510 MB
node 2 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
81 82 83
node 2 size: 258006 MB
node 2 free: 257750 MB
node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
106 107 108 109 110 111
node 3 size: 258011 MB
node 3 free: 257723 MB
node distances:
node 0 1 2 3
0: 10 12 21 21
1: 12 10 21 21
2: 21 21 10 12
3: 21 21 12 10

From /proc/meminfo
MemTotal:       1056503088 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
/sysdevices/system/cpu/cpu*/cpufreq/scaling_governor has
performance

From /etc/*release* /etc/*version*

os-release:
NAME="SLES"
VERSION="15-SP4"
VERSION_ID="15.4"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
ID="sles"
ID_LIKE="suse"
ANCE_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp4"

uname -a:
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18
UTC 2022 (49db222) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
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: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

(Continued on next page)
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CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Platform Notes (Continued)

run-level 3 Dec 1 17:36
SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p8 xfs 1.3T 13G 1.3T 1% /

From /sys/devices/virtual/dmi/id
Vendor: ASUSTeK COMPUTER INC.
Product: RS720-E11-RS12U
Product Family: Server

Additional information from dmidecode 3.2 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:
16x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 0401
BIOS Date: 11/18/2022
BIOS Revision: 4.1

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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316 |
|         | Copyright (C) 1985-2022 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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316 |
|         | Copyright (C) 1985-2022 Intel Corporation. All rights reserved.                                             |
|         | ------------------------------------------------------------------------------------------------------------|
| Fortran | 648.exchange2_s(base, peak)                                                                               |
|         | Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316          |
|         | Copyright (C) 1985-2022 Intel Corporation. All rights reserved.                                             |
|         | ------------------------------------------------------------------------------------------------------------|
|         | Base Compiler Invocation                                                                                 |
|         | C benchmarks: icx                                                                                         |
|         | (Continued on next page)                                                                                 |

Page 6  Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
ASUSTeK Computer Inc.

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Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

Base Compiler Invocation (Continued)

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

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:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -flto
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-FL/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-FL/usr/local/jemalloc64-5.0.1/lib -ljemalloc
# SPEC CPU®2017 Integer Speed Result

**ASUSTeK Computer Inc.**  
ASUS RS720-E11(Z13PP-D32) Server System  
(2.00 GHz, Intel Xeon Platinum 8480+)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.7</td>
<td>15.0</td>
</tr>
</tbody>
</table>

---

## Peak Compiler Invocation

**C benchmarks:**  
icx

**C++ benchmarks:**  
icpx

**Fortran benchmarks:**  
ifx

---

## Peak Portability Flags

Same as Base Portability Flags

---

## Peak Optimization Flags

**C benchmarks:**

```bash
600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1) -fprofile-use=default.profdatabase(pass 2) -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -fno-strict-overflow -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1) -fprofile-use=default.profdatabase(pass 2) -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s: basepeak = yes
```

**C++ benchmarks:**

(Continued on next page)
SPEC CPU®2017 Integer Speed Result
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ASUSTeK Computer Inc.
ASUS RS720-E11(Z13PP-D32) Server System
(2.00 GHz, Intel Xeon Platinum 8480+)

SPECspeed®2017_int_base = 14.7
SPECspeed®2017_int_peak = 15.0

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

Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
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
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z13-V1.0.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z13-V1.0.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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