### SPEC CPU®2017 Integer Rate Result

**ASUSTeK Computer Inc.**

ASUS RS300-E11(P12R-M) Server System

(2.90 GHz, Intel Xeon E-2336)

**SPECrater®2017_int_base = 56.6**

**SPECrater®2017_int_peak = 59.0**

**CPU2017 License:** 9016  
**Test Date:** Jan-2022  
**Test Sponsor:** ASUSTeK Computer Inc.  
**Hardware Availability:** Oct-2021  
**Tested by:** ASUSTeK Computer Inc.  
**Software Availability:** Sep-2021

<table>
<thead>
<tr>
<th>Program</th>
<th>Result (Copies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_r</td>
<td>46.4</td>
</tr>
<tr>
<td>gcc_r</td>
<td>40.8</td>
</tr>
<tr>
<td>mcf_r</td>
<td>50.9</td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>30.2</td>
</tr>
<tr>
<td>xalancbmk_r</td>
<td>73.2</td>
</tr>
<tr>
<td>x264_r</td>
<td>125</td>
</tr>
<tr>
<td>deepsjeng_r</td>
<td>45.9</td>
</tr>
<tr>
<td>leela_r</td>
<td>45.6</td>
</tr>
<tr>
<td>exchange2_r</td>
<td>123</td>
</tr>
<tr>
<td>xz_r</td>
<td>30.8</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon E-2336  
- **Max MHz:** 4800  
- **Nominal:** 2900  
- **Enabled:** 6 cores, 1 chip, 2 threads/core  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 512 KB I+D on chip per core  
- **L3:** 12 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 64 GB (2 x 32 GB 2Rx8 PC4-3200AA-E)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux release 8.4 (Ootpa)  
  4.18.0-305.19.1.el8_4.x86_64  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux
- **Parallel:** No  
- **Firmware:** Version 0401 released Oct-2021  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_r</td>
<td>12</td>
<td>474</td>
<td>40.3</td>
<td>479</td>
<td>39.9</td>
<td>477</td>
<td><strong>40.0</strong></td>
<td>12</td>
<td>412</td>
<td>46.4</td>
<td>412</td>
<td>46.4</td>
<td>412</td>
<td>46.3</td>
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<tr>
<td>gcc_r</td>
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<td>40.9</td>
<td><strong>416</strong></td>
<td><strong>40.8</strong></td>
<td>416</td>
<td>40.8</td>
<td>12</td>
<td>334</td>
<td>50.9</td>
<td>333</td>
<td>51.0</td>
<td><strong>334</strong></td>
<td>50.9</td>
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<tr>
<td>mcf_r</td>
<td>12</td>
<td>205</td>
<td><strong>94.7</strong></td>
<td>205</td>
<td>94.6</td>
<td>204</td>
<td>94.9</td>
<td>12</td>
<td>205</td>
<td><strong>94.7</strong></td>
<td>205</td>
<td>94.6</td>
<td>204</td>
<td>94.9</td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>12</td>
<td>521</td>
<td>30.2</td>
<td>520</td>
<td>30.3</td>
<td><strong>521</strong></td>
<td><strong>30.2</strong></td>
<td>12</td>
<td>521</td>
<td>30.2</td>
<td>520</td>
<td>30.3</td>
<td>521</td>
<td><strong>30.2</strong></td>
</tr>
<tr>
<td>xalancbmk_r</td>
<td>12</td>
<td>174</td>
<td>73.0</td>
<td><strong>173</strong></td>
<td><strong>73.2</strong></td>
<td>173</td>
<td>73.3</td>
<td>12</td>
<td>174</td>
<td>73.0</td>
<td><strong>173</strong></td>
<td><strong>73.2</strong></td>
<td>173</td>
<td>73.3</td>
</tr>
<tr>
<td>x264_r</td>
<td>12</td>
<td>168</td>
<td>125</td>
<td><strong>168</strong></td>
<td><strong>125</strong></td>
<td>168</td>
<td>125</td>
<td>12</td>
<td>160</td>
<td>131</td>
<td>160</td>
<td>131</td>
<td>160</td>
<td>131</td>
</tr>
<tr>
<td>xz_r</td>
<td>12</td>
<td>420</td>
<td>30.8</td>
<td>421</td>
<td>30.8</td>
<td><strong>421</strong></td>
<td><strong>30.8</strong></td>
<td>12</td>
<td>420</td>
<td>30.8</td>
<td>421</td>
<td>30.8</td>
<td>421</td>
<td><strong>30.8</strong></td>
</tr>
</tbody>
</table>

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset commands to bind each copy to a specific processor. For details, please see the config file.

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:
LD_LIBRARY_PATH = "/home/cpu118/lib/intel64:/home/cpu118/lib/ia32:/home/cpu118/je5.0.1-32"
MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Red Hat Enterprise Linux 8.1
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

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

ASUSTeK Computer Inc.
ASUS RS300-E11(P12R-M) Server System
(2.90 GHz, Intel Xeon E-2336)

SPECrate®2017_int_base = 56.6
SPECrate®2017_int_peak = 59.0

Copyright 2017-2022 Standard Performance Evaluation Corporation

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

Test Date: Jan-2022
Hardware Availability: Oct-2021
Software Availability: Sep-2021

General Notes (Continued)

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
AES = Disabled
Intel Speed Shift Technology = Native Mode
Engine Boost = Level3(Max)
Race to Halt (RTH) = Disabled

Sysinfo program /home/cpu118/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6c64d
running on localhost.localdomain Sat Jan 15 20:51:02 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) E-2336 CPU @ 2.90GHz
 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 from util-linux 2.32.1:
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

(Continued on next page)
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<table>
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</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 56.6**

**SPECrate®2017_int_peak = 59.0**

### Platform Notes (Continued)

| NUMA node(s): | 1 |
| Vendor ID:    | GenuineIntel |
| BIOS Vendor ID: | Intel(R) Corporation |
| CPU family:   | 6 |
| Model:        | 167 |
| Model name:   | Intel(R) Xeon(R) E-2336 CPU @ 2.90GHz |
| BIOS Model name: | Intel(R) Xeon(R) E-2336 CPU @ 2.90GHz |
| Stepping:     | 1 |
| CPU MHz:      | 3784.231 |
| CPU max MHz:  | 4800.0000 |
| CPU min MHz:  | 800.0000 |
| BogoMIPS:     | 5808.00 |
| Virtualization: | VT-x |
| L1d cache:    | 48K |
| L1i cache:    | 32K |
| L2 cache:     | 512K |
| 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 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 xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb stibp ibrs_enhanced tpr_shadow vmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bm11 avx2 smep bmi2 erms invpd mpx avx512f avx512dq rdseed adx smap avx512ifma clflushopt intel_pt avx512cd sha_ni avx512bw avx512vl xsavesopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp hwp_pkg_req avx512vbm1 umip pkp ospke avx512_vbmi2 gfni vpcmullqdq avx512_vnni avx512_bitalg avx512_vpopcntdq rdpid fsrmd clear flush_lld arch_capabilities |

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: 64198 MB

node 0 free: 61506 MB

node distances:

node 0

0: 10

From /proc/meminfo

MemTotal: 65739328 kB

HugePages_Total: 0

(Continued on next page)
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Platform Notes (Continued)

Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: throughput-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.4 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.4"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.4:ga
uname -a:
Linux localhost.localdomain 4.18.0-305.19.1.el8_4.x86_64 #1 SMP Tue Sep 7 07:07:31 EDT 2021 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): Mitigation: Speculative Store
CVE-2018-3639 (Speculative Store Bypass): Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps
CVE-2017-5715 (Spectre variant 2): barriers and __user pointer
CVE-2020-0543 (Special Register Buffer Data Sampling): sanitation
CVE-2019-11135 (TSX Asynchronous Abort): Mitigation: Enhanced IBRS, IBPB:
run-level 3 Jan 14 07:13
conditional, RSB filling

run-level 3 Jan 14 07:13

SPEC is set to: /home/cpu118

Filesystem Type Size Used Avail Use% Mounted on

(Continued on next page)
## Platform Notes (Continued)

/dev/mapper/rhel-home xfs 807G 11G 797G 2% /home

From /sys/devices/virtual/dmi/id

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:
2x Apacer Technology D33.27306S.003 32 GB 2 rank 3200

BIOS:
- BIOS Vendor: American Megatrends Inc.
- BIOS Version: 0401
- BIOS Date: 10/26/2021
- BIOS Revision: 4.1

(End of data from sysinfo program)

## Compiler Version Notes

<table>
<thead>
<tr>
<th>Compiler Version</th>
<th>Benchmark(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C</strong></td>
<td>500.perlbench_r(peak)</td>
</tr>
<tr>
<td><strong>Intel(R) C</strong></td>
<td>Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000</td>
</tr>
<tr>
<td><strong>Copyright</strong></td>
<td>(C) 1985-2020 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

| **C**            | 502.gcc_r(peak) |
| **Intel(R) oneAPI DPC++/C++ Compiler** | for applications running on IA-32, Version 2021.1 Build 20201113 |
| **Copyright**    | (C) 1985-2020 Intel Corporation. All rights reserved. |

| **C**            | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak) |
| **Intel(R) oneAPI DPC++/C++ Compiler** | for applications running on Intel(R) 64, Version 2021.1 Build 20201113 |
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(Continued on next page)
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**Compiler Version Notes (Continued)**

==============================================================================
C       | 500.perlbench_r(peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
C       | 525.x264_r(base, peak) 557.xz_r(base, peak)
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==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
C       | 525.x264_r(base, peak) 557.xz_r(base, peak)
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Compiler Version Notes (Continued)

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```
C++    | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
       | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Fortran | 548.exchange2_r(base, peak)
```

```
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

```
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mc_f_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
```

(Continued on next page)
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Base Portability Flags (Continued)

557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-!/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-!/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-!/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

500.perlbench_r: icc

C++ benchmarks:
icpx

Fortran benchmarks:
ifort
ASUSTeK Computer Inc.  
ASUS RS300-E11(P12R-M) Server System  
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CPU2017 License: 9016  
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Tested by: ASUSTeK Computer Inc.  

---

**Peak Portability Flags**

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64  
502.gcc_r: -D_FILE_OFFSET_BITS=64  
505.mcf_r: -DSPEC_LP64  
520.omnetpp_r: -DSPEC_LP64  
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX  
525.x264_r: -DSPEC_LP64  
531.deepsjeng_r: -DSPEC_LP64  
541.leela_r: -DSPEC_LP64  
548.exchange2_r: -DSPEC_LP64  
557.xz_r: -DSPEC_LP64  

---

**Peak Optimization Flags**

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)  
-xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -fno-strict-overflow  
-mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmalloc  

502.gcc_r: -m32  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin  
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)  
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto  
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries  
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc  

505.mcf_r: basepeak = yes  

520.omnetpp_r: basepeak = yes  

C++ benchmarks:

520.omnetpp_r: basepeak = yes

---

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

ASUSTeK Computer Inc.  
ASUS RS300-E11(P12R-M) Server System  
(2.90 GHz, Intel Xeon E-2336)

**SPECrate®2017_int_base = 56.6**  
**SPECrate®2017_int_peak = 59.0**

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<th>Test Date: Jan-2022</th>
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<td>Hardware Availability: Oct-2021</td>
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<tr>
<td>Tested by: ASUSTeK Computer Inc.</td>
<td>Software Availability: Sep-2021</td>
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</tbody>
</table>

**Peak Optimization Flags (Continued)**

523.xalancbmk_r:basepeak = yes

531.deepsjeng_r:basepeak = yes

541.leela_r:basepeak = yes

Fortran benchmarks:

548.exchange2_r:basepeak = yes

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

http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p12-V1.2.html


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

http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p12-V1.2.xml

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.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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