SPEC® CPU2017 Integer Rate Result

ASUSTeK Computer Inc.

ASUS RS300-E10(P11C-C/4L) Server System
(3.40 GHz, Intel Xeon E-2124G)

SPECrate2017_int_base =   25.3
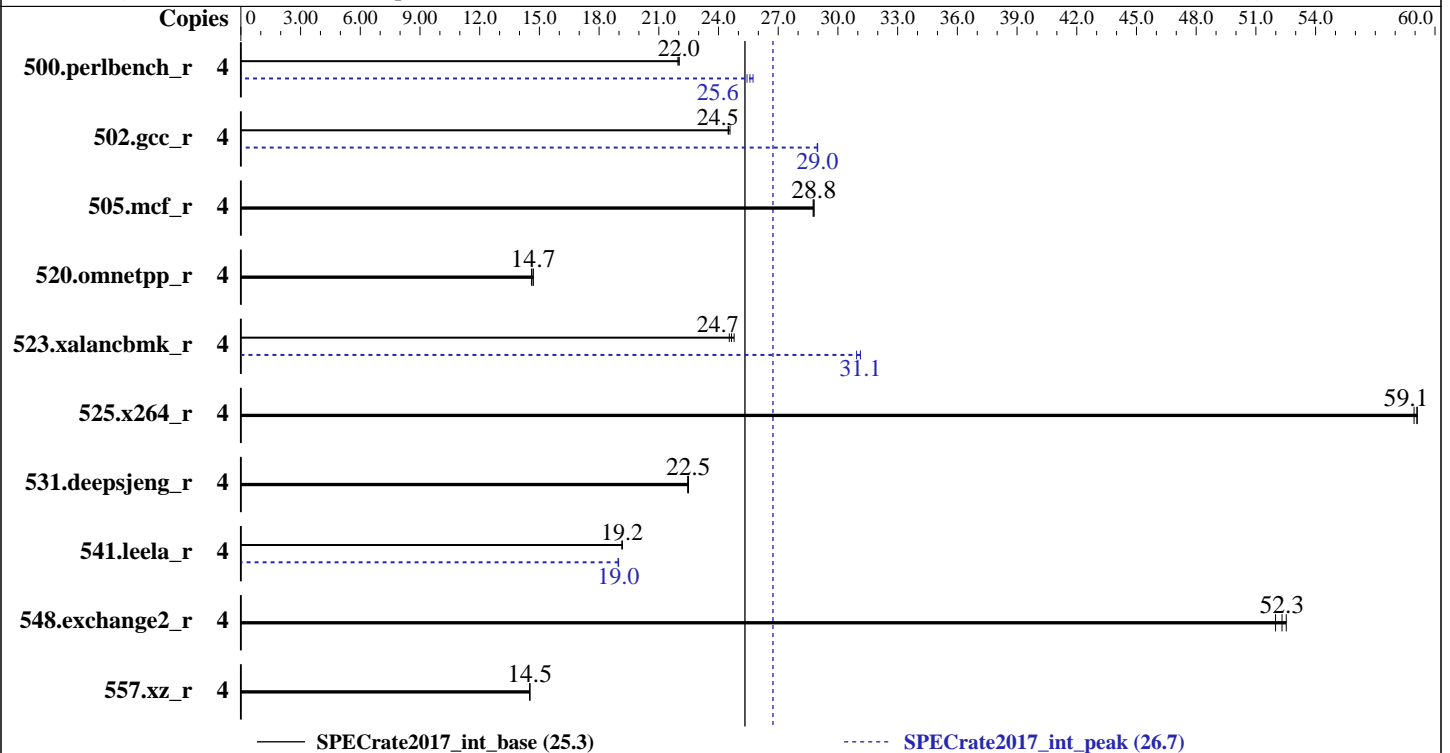
SPECrate2017_int_peak =   26.7

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

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

Benchmark	Copies	Base	Peak
500.perlbench_r	4	22.0	25.6
502.gcc_r	4	24.5	29.0
505.mcf_r	4	28.8	
520.omnetpp_r	4	14.7	
523.xalancbmk_r	4	24.7	31.1
525.x264_r	4	59.1	
531.deepsjeng_r	4	22.5	
541.leela_r	4	19.2	19.0
548.exchange2_r	4	52.3	
557.xz_r	4	14.5	

—— SPECrate2017_int_base (25.3)   ----- **SPECrate2017_int_peak (26.7)**

Hardware

CPU Name: Intel Xeon E-2124G
 Max MHz.:   4500
 Nominal: 3400
Enabled: 4 cores, 1 chip
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:   8 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

Software

OS: SUSE Linux Enterprise Server 12 (x86_64) SP3
   Kernel 4.4.120-94.17-default
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
   Compiler for Linux;
   Fortran: Version 19.0.1.144 of Intel Fortran
   Compiler for Linux
Parallel: No
Firmware: Version 0502 released Feb-2019
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc: jemalloc memory allocator library
   V5.0.1

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
500.perlbench_r	4	289	22.0	290	22.0	**289**	**22.0**	4	**249**	**25.6**	250	25.4	247	25.7
502.gcc_r	4	230	24.6	231	24.5	**231**	**24.5**	4	195	29.0	196	29.0	**195**	**29.0**
505.mcf_r	4	225	28.8	**225**	**28.8**	224	28.8	4	225	28.8	**225**	**28.8**	224	28.8
520.omnetpp_r	4	359	14.6	**357**	**14.7**	357	14.7	4	359	14.6	**357**	**14.7**	357	14.7
523.xalancbmk_r	4	172	24.5	**171**	**24.7**	170	24.8	4	137	30.9	136	31.1	**136**	**31.1**
525.x264_r	4	**119**	**59.1**	118	59.1	119	58.9	4	**119**	**59.1**	118	59.1	119	58.9
531.deepsjeng_r	4	204	22.5	204	22.4	**204**	**22.5**	4	204	22.5	204	22.4	**204**	**22.5**
541.leela_r	4	**346**	**19.2**	346	19.2	346	19.2	4	**349**	**19.0**	349	19.0	349	19.0
548.exchange2_r	4	200	52.5	**200**	**52.3**	202	52.0	4	200	52.5	**200**	**52.3**	202	52.0
557.xz_r	4	297	14.5	**298**	**14.5**	298	14.5	4	297	14.5	**298**	**14.5**	298	14.5

SPECrate2017_int_base = **25.3**

SPECrate2017_int_peak = **26.7**

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"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/spec2017_2019u1/lib/ia32:/spec2017_2019u1/lib/intel64:
/spec2017_2019u1/je5.0.1-32:/spec2017_2019u1/je5.0.1-64"
 Binaries compiled on a system with 1x Intel Core i7-6700K 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
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

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General Notes (Continued)

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.

Platform Notes

```
BIOS Configuration:
VT-d = Disabled
AES = Disabled
Hardware Prefetcher = Disabled
Adjacent Cache Line Prefetch = Disabled
Race to Halt (RTH) = Disabled
 Sysinfo program /spec2017_2019u1/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-pmm5 Tue Apr  2 10:21:15 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-2124G CPU @ 3.40GHz
       1  "physical id"s (chips)
       4 "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 : 4
       siblings  : 4
       physical 0: cores 0 1 2 3

 From lscpu:
    Architecture:        x86_64
    CPU op-mode(s):      32-bit, 64-bit
    Byte Order:          Little Endian
    CPU(s):              4
    On-line CPU(s) list: 0-3
    Thread(s) per core:  1
    Core(s) per socket:  4
    Socket(s):           1
    NUMA node(s):        1
    Vendor ID:           GenuineIntel
    CPU family:          6
    Model:               158
    Model name:          Intel(R) Xeon(R) E-2124G CPU @ 3.40GHz
```

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Platform Notes (Continued)

```
        Stepping:              10
        CPU MHz:               4398.518
        CPU max MHz:           4500.0000
        CPU min MHz:           800.0000
        BogoMIPS:              6815.97
        Virtualization:        VT-x
        L1d cache:             32K
        L1i cache:             32K
        L2 cache:              256K
        L3 cache:              8192K
        NUMA node0 CPU(s):     0-3
        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
     aperfmperf eagerfpu 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 ida arat epb invpcid_single pln pts dtherm
     hwp hwp_notify hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl stibp retpoline
     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 : 8192 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
    node 0 size: 64315 MB
    node 0 free: 63809 MB
    node distances:
    node   0
      0:  10

  From /proc/meminfo
     MemTotal:       65859564 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:
```

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

Platform Notes (Continued)

```
        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

   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 Apr 2 10:20

   SPEC is set to: /spec2017_2019u1
      Filesystem      Type   Size  Used Avail Use% Mounted on
      /dev/sda2       btrfs  445G  116G  328G  27% /

   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 02/26/2019
     Memory:
      4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 2666

   (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC   500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
      525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CC   500.perlbench_r(peak) 502.gcc_r(peak)
```

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Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------


==========================================================================
 CXXC 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base,
      peak) 541.leela_r(base)
--------------------------------------------------------------------------
icpc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------


==========================================================================
 CXXC 523.xalancbmk_r(peak) 541.leela_r(peak)
--------------------------------------------------------------------------
icpc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------


==========================================================================
 FC  548.exchange2_r(base, peak)
--------------------------------------------------------------------------
ifort (IFORT) 19.0.1.144 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

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`

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Base Portability Flags (Continued)

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`

Base Optimization Flags

C benchmarks:
`-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
`-qopt-mem-layout-trans=3 -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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

Fortran benchmarks:
`-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
`-qopt-mem-layout-trans=3 -nostandard-realloc-lhs`
`-L/usr/local/je5.0.1-64/lib -ljemalloc`

Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m64 -std=c11`

502.gcc_r: `icc -m32 -std=c11 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin`

C++ benchmarks (except as noted below):
`icpc -m64`

523.xalancbmk_r: `icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin`

Fortran benchmarks:
`ifort -m64`

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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: `-D_FILE_OFFSET_BITS=64 -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) `-ipo`
`-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3`
`-fno-strict-overflow -L/usr/local/je5.0.1-64/lib`
`-ljemalloc`

502.gcc_r: `-Wl,-z,muldefs` -prof-gen(pass 1) -prof-use(pass 2) `-ipo`
`-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3`
`-L/usr/local/je5.0.1-32/lib -ljemalloc`

505.mcf_r: basepeak = yes

525.x264_r: basepeak = yes

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: `-Wl,-z,muldefs` -prof-gen(pass 1) -prof-use(pass 2) `-ipo`
`-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3`
`-L/usr/local/je5.0.1-32/lib -ljemalloc`

531.deepsjeng_r: basepeak = yes

541.leela_r: `-Wl,-z,muldefs` -prof-gen(pass 1) -prof-use(pass 2) `-ipo`
`-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3`
`-L/usr/local/je5.0.1-64/lib -ljemalloc`

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Peak Optimization Flags (Continued)

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-p11-V2.0-revA.html
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p11-V2.0-revA.xml
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.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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