SPEC® CPU2017 Integer Rate Result

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ASUSTeK Computer Inc.

ASUS RS720Q-E9(Z11PH-D12) Server System
(3.20 GHz, Intel Xeon Gold 6134)

SPECrate2017_int_base =   113
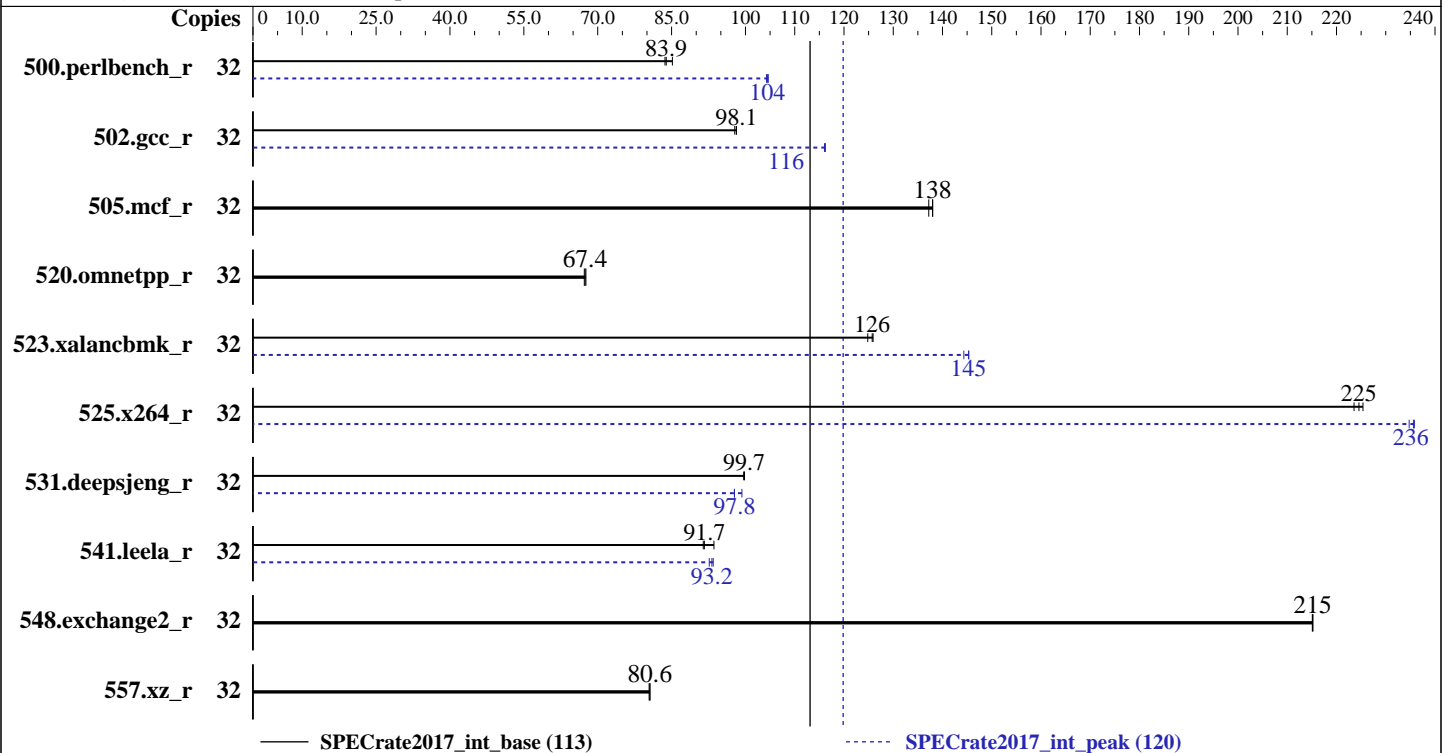
SPECrate2017_int_peak =   120

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Jul-2018

Hardware Availability: Mar-2018

Software Availability: Mar-2018

Benchmark	Copies	base	peak
500.perlbench_r	32	83.9	104
502.gcc_r	32	98.1	116
505.mcf_r	32	138	
520.omnetpp_r	32	67.4	
523.xalancbmk_r	32	126	145
525.x264_r	32	225	236
531.deepsjeng_r	32	99.7	97.8
541.leela_r	32	91.7	93.2
548.exchange2_r	32	215	
557.xz_r	32	80.6	

SPECrate2017_int_base (113)

SPECrate2017_int_peak (120)

Hardware

CPU Name: Intel Xeon Gold 6134

Max MHz.:   3700

Nominal: 3200

Enabled: 16 cores, 2 chips, 2 threads/core

Orderable: 1, 2 chip(s)

Cache L1:   32 KB I + 32 KB D on chip per core

  L2:   1 MB I+D on chip per core

  L3:   24.75 MB I+D on chip per chip

  Other: None

Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)

Storage: 1 x 240 GB SATA SSD

Other: None

Software

OS: SUSE Linux Enterprise Server 12 (x86_64) SP3
Kernel 4.4.120-94.17-default

Compiler: C/C++: Version 18.0.3.222 of Intel C/C++
Compiler for Linux;
Fortran: Version 18.0.3.222 of Intel Fortran
Compiler for Linux

Parallel: No

Firmware: Version 0905 released Mar-2018

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						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	32	609	83.7	598	85.2	**607**	**83.9**	32	487	105	**488**	**104**	489	104
502.gcc_r	32	462	98.2	**462**	**98.1**	463	97.8	32	390	116	390	116	**390**	**116**
505.mcf_r	32	**375**	**138**	375	138	377	137	32	**375**	**138**	375	138	377	137
520.omnetpp_r	32	**623**	**67.4**	624	67.3	621	67.6	32	**623**	**67.4**	624	67.3	621	67.6
523.xalancbmk_r	32	**269**	**126**	268	126	271	125	32	234	144	**233**	**145**	232	145
525.x264_r	32	**250**	**225**	251	224	249	225	32	239	235	**238**	**236**	238	236
531.deepsjeng_r	32	**368**	**99.7**	367	99.8	368	99.6	32	369	99.3	**375**	**97.8**	375	97.8
541.leela_r	32	**578**	**91.7**	566	93.6	580	91.4	32	567	93.5	**569**	**93.2**	572	92.6
548.exchange2_r	32	**390**	**215**	390	215	390	215	32	**390**	**215**	390	215	390	215
557.xz_r	32	429	80.6	**429**	**80.6**	430	80.4	32	429	80.6	**429**	**80.6**	430	80.4
SPECrate2017_int_base =	**113**											
SPECrate2017_int_peak =	**120**											

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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/lib/ia32:/spec2017/lib/intel64:/spec2017/je5.0.1-32:/spec2017/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
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

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General Notes (Continued)

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.

Platform Notes

```
BIOS Configuration:
SNC = Enabled
IMC interleaving = 1 way
Patrol Scrub = Disabled
VT-d = Disabled
ENERGY_PERF_BIAS_CFG mode = Performance
HyperThreading = Enabled
 Sysinfo program /spec2017/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-pmm5 Wed Jul 18 09:20:43 2018

 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) Gold 6134 CPU @ 3.20GHz
       2  "physical id"s (chips)
       32 "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 : 8
       siblings  : 16
       physical 0: cores 1 2 3 4 8 18 24 27
       physical 1: cores 0 2 3 9 16 19 26 27

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                32
      On-line CPU(s) list:   0-31
      Thread(s) per core:    2
      Core(s) per socket:    8
      Socket(s):             2
      NUMA node(s):          4
      Vendor ID:             GenuineIntel
```

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Test Sponsor:	ASUSTeK Computer Inc.	**Hardware Availability:**	Mar-2018
Tested by:	ASUSTeK Computer Inc.	**Software Availability:**	Mar-2018

Platform Notes (Continued)

```
        CPU family:            6
        Model:                 85
        Model name:            Intel(R) Xeon(R) Gold 6134 CPU @ 3.20GHz
        Stepping:              4
        CPU MHz:               3201.000
        CPU max MHz:           3201.0000
        CPU min MHz:           1200.0000
        BogoMIPS:              6592.30
        Virtualization:        VT-x
        L1d cache:             32K
        L1i cache:             32K
        L2 cache:              1024K
        L3 cache:              25344K
        NUMA node0 CPU(s):     0,1,4,6,16,17,20,22
        NUMA node1 CPU(s):     2,3,5,7,18,19,21,23
        NUMA node2 CPU(s):     8,9,11,12,24,25,27,28
        NUMA node3 CPU(s):     10,13-15,26,29-31
        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 dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
    xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
    dtherm 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
    cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
    xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

 /proc/cpuinfo cache data
    cache size : 25344 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 4 nodes (0-3)
   node 0 cpus: 0 1 4 6 16 17 20 22
   node 0 size: 95307 MB
   node 0 free: 95100 MB
   node 1 cpus: 2 3 5 7 18 19 21 23
   node 1 size: 96759 MB
   node 1 free: 96552 MB
   node 2 cpus: 8 9 11 12 24 25 27 28
   node 2 size: 96759 MB
   node 2 free: 96582 MB
   node 3 cpus: 10 13 14 15 26 29 30 31
   node 3 size: 96757 MB
   node 3 free: 96553 MB
   node distances:
```

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Platform Notes (Continued)

```
   node   0   1   2   3
     0:   10  11  21  21
     1:   11  10  21  21
     2:   21  21  10  11
     3:   21  21  11  10

From /proc/meminfo
   MemTotal:       394837552 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

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 Jul 18 09:19

SPEC is set to: /spec2017
   Filesystem      Type   Size  Used Avail Use% Mounted on
   /dev/sda2       btrfs  203G   93G  109G  47% /

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.
```

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Platform Notes (Continued)

```
   BIOS American Megatrends Inc. 0905 03/19/2018
   Memory:
    12x Kingston D4-26662R4-32G 32 GB 2 rank 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) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CC    500.perlbench_r(peak) 502.gcc_r(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CXXC 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CXXC 523.xalancbmk_r(peak) 531.deepsjeng_r(peak) 541.leela_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  FC  548.exchange2_r(base, peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.3 20180410
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

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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`
   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-AVX512 -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-AVX512 -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-AVX512 -ipo -O3 -no-prec-div`
`-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
`-L/usr/local/je5.0.1-64/lib -ljemalloc`

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Peak Compiler Invocation

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

502.gcc_r: `icc -m32 -std=c11 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32`

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

523.xalancbmk_r: `icpc -m32 -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32`

Fortran benchmarks:
```
ifort -m64
```

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-AVX512 -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-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc`

505.mcf_r: `basepeak = yes`

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Standard Performance Evaluation Corporation (info@spec.org)
https://www.spec.org/

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Peak Optimization Flags (Continued)

525.x264_r: `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
`-qopt-mem-layout-trans=3 -fno-alias`
`-L/usr/local/je5.0.1-64/lib -ljemalloc`

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-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3`
`-L/usr/local/je5.0.1-32/lib -ljemalloc`

531.deepsjeng_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`
`-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3`
`-L/usr/local/je5.0.1-64/lib -ljemalloc`

541.leela_r: `Same as 531.deepsjeng_r`

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-z11-V2.0-revD.html
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-z11-V2.0-revD.xml
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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

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