SPEC CPU®2017 Integer Rate Result

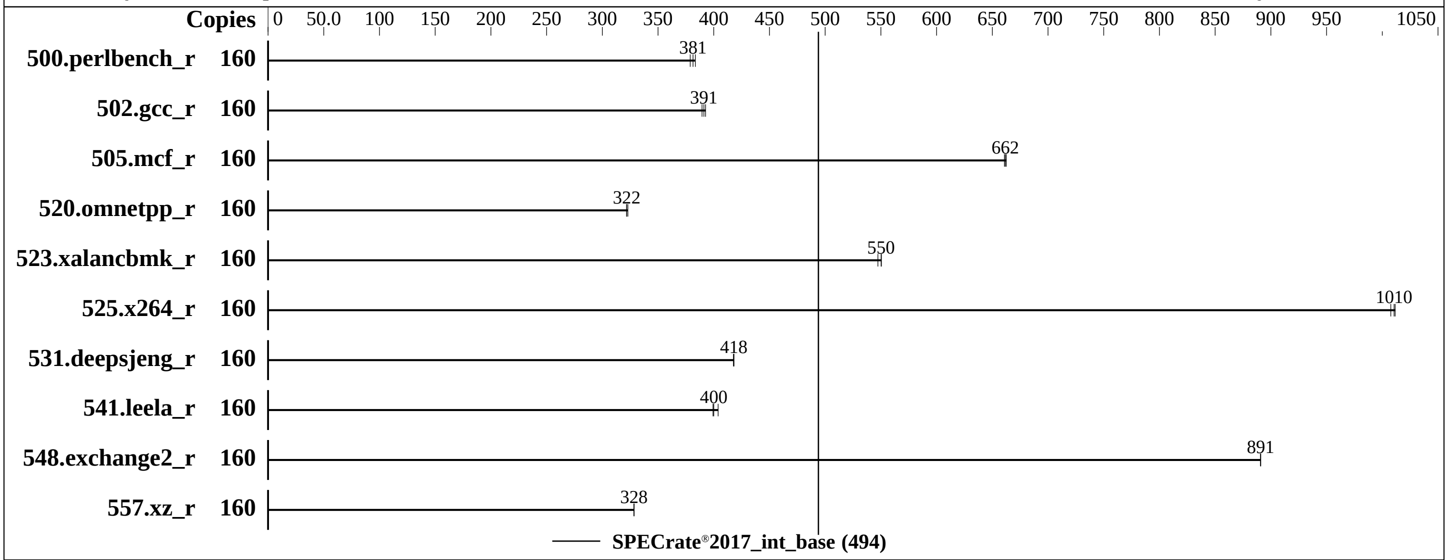
Supermicro

SuperServer 2049U-TR4
(X11QPH+, Intel Xeon Gold 6248)

SPECrate®2017_int_base = 494

SPECrate®2017_int_peak = Not Run

CPU2017 License:	001176	**Test Date:**	Aug-2019
Test Sponsor:	Supermicro	**Hardware Availability:**	Apr-2019
Tested by:	Supermicro	**Software Availability:**	Dec-2018



Hardware

CPU Name:	Intel Xeon Gold 6248
Max MHz:	3900
Nominal:	2500
Enabled:	80 cores, 4 chips, 2 threads/core
Orderable:	1,2,4 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	27.5 MB I+D on chip per chip
Other:	None
Memory:	1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)
Storage:	240 GB SATA 3 SSD
Other:	None

Software

OS:	SUSE Linux Enterprise Server 12 SP4 4.12.14-94.41-default
Compiler:	C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux; Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux
Parallel:	No
Firmware:	version 3.1 released May-2019
File System:	xfs
System State:	Run level 3 (Multi-user mode with networking)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	None
Power Management:	--

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	160	664	383	672	379	**668**	**381**							
502.gcc_r	160	**579**	**391**	582	389	577	393							
505.mcf_r	160	390	663	**391**	**662**	391	661							
520.omnetpp_r	160	652	322	650	323	**652**	**322**							
523.xalancbmk_r	160	**307**	**550**	307	550	309	547							
525.x264_r	160	**277**	**1010**	278	1010	277	1010							
531.deepsjeng_r	160	439	418	**439**	**418**	439	418							
541.leela_r	160	664	399	**662**	**400**	656	404							
548.exchange2_r	160	471	891	471	891	**471**	**891**							
557.xz_r	160	**526**	**328**	526	329	526	328							

SPECrate®2017_int_base = 494

SPECrate®2017_int_peak = Not Run

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 = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/
je5.0.1-32:/home/cpu2017/je5.0.1-64"
 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
 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>
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)
```

(Continued on next page)

General Notes (Continued)

```
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4)
is mitigated in the system as tested and documented.
```

Platform Notes

```
BIOS Settings:
Monitor/Mwait = Disabled
ENERGY_PERF_BIAS_CFG mode = Max Performance
ADDDC = Disabled
SNC = Enabled
Stale Atos = Disabled
IMC Interleaving = 1-way Interleave
Patrol Scrub = Disabled
Intel Virtualization Technology = Disabled
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux Wed Aug 14 11:45:02 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) Gold 6248 CPU @ 2.50GHz
       4  "physical id"s (chips)
       160 "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 : 20
       siblings  : 40
       physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
       physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
       physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
       physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                160
      On-line CPU(s) list:   0-159
      Thread(s) per core:    2
      Core(s) per socket:    20
```

(Continued on next page)

Platform Notes (Continued)

```
    Socket(s):               4
    NUMA node(s):            8
    Vendor ID:               GenuineIntel
    CPU family:              6
    Model:                   85
    Model name:              Intel(R) Xeon(R) Gold 6248 CPU @ 2.50GHz
    Stepping:                6
    CPU MHz:                 2500.000
    CPU max MHz:             3900.0000
    CPU min MHz:             1000.0000
    BogoMIPS:                5000.00
    Virtualization:          VT-x
    L1d cache:               32K
    L1i cache:               32K
    L2 cache:                1024K
    L3 cache:                28160K
    NUMA node0 CPU(s):       0-2,5,6,10-12,15,16,80-82,85,86,90-92,95,96
    NUMA node1 CPU(s):       3,4,7-9,13,14,17-19,83,84,87-89,93,94,97-99
    NUMA node2 CPU(s):       20-22,25,26,30-32,35,36,100-102,105,106,110-112,115,116
    NUMA node3 CPU(s):       23,24,27-29,33,34,37-39,103,104,107-109,113,114,117-119
    NUMA node4 CPU(s):       40-42,45,46,50-52,55,56,120-122,125,126,130-132,135,136
    NUMA node5 CPU(s):       43,44,47-49,53,54,57-59,123,124,127-129,133,134,137-139
    NUMA node6 CPU(s):       60-62,65,66,70-72,75,76,140-142,145,146,150-152,155,156
    NUMA node7 CPU(s):       63,64,67-69,73,74,77-79,143,144,147-149,153,154,157-159
    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 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_ppin ssbd mba ibrs ibpb stibp 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 xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
    dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data
   cache size : 28160 KB

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 8 nodes (0-7)
  node 0 cpus: 0 1 2 5 6 10 11 12 15 16 80 81 82 85 86 90 91 92 95 96
  node 0 size: 192033 MB
  node 0 free: 191717 MB
  node 1 cpus: 3 4 7 8 9 13 14 17 18 19 83 84 87 88 89 93 94 97 98 99
  node 1 size: 193526 MB
```

(Continued on next page)

Supermicro
SuperServer 2049U-TR4
(X11QPH+, Intel Xeon Gold 6248)

SPECrate®2017_int_base = 494
SPECrate®2017_int_peak = Not Run

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro
Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Platform Notes (Continued)

```
     node 1 free: 193336 MB
     node 2 cpus: 20 21 22 25 26 30 31 32 35 36 100 101 102 105 106 110 111 112 115 116
     node 2 size: 193526 MB
     node 2 free: 193296 MB
     node 3 cpus: 23 24 27 28 29 33 34 37 38 39 103 104 107 108 109 113 114 117 118 119
     node 3 size: 193526 MB
     node 3 free: 193315 MB
     node 4 cpus: 40 41 42 45 46 50 51 52 55 56 120 121 122 125 126 130 131 132 135 136
     node 4 size: 193526 MB
     node 4 free: 193340 MB
     node 5 cpus: 43 44 47 48 49 53 54 57 58 59 123 124 127 128 129 133 134 137 138 139
     node 5 size: 193498 MB
     node 5 free: 193290 MB
     node 6 cpus: 60 61 62 65 66 70 71 72 75 76 140 141 142 145 146 150 151 152 155 156
     node 6 size: 193526 MB
     node 6 free: 193342 MB
     node 7 cpus: 63 64 67 68 69 73 74 77 78 79 143 144 147 148 149 153 154 157 158 159
     node 7 size: 193311 MB
     node 7 free: 193136 MB
     node distances:
     node   0   1   2   3   4   5   6   7
       0:  10  11  21  21  21  21  21  21
       1:  11  10  21  21  21  21  21  21
       2:  21  21  10  11  21  21  21  21
       3:  21  21  11  10  21  21  21  21
       4:  21  21  21  21  10  11  21  21
       5:  21  21  21  21  11  10  21  21
       6:  21  21  21  21  21  21  10  11
       7:  21  21  21  21  21  21  11  10

 From /proc/meminfo
    MemTotal:       1583592584 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP4

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 12 (x86_64)
       VERSION = 12
       PATCHLEVEL = 4
       # 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"
```

(Continued on next page)

Supermicro
SuperServer 2049U-TR4
(X11QPH+, Intel Xeon Gold 6248)

SPECrate®2017_int_base = 494
SPECrate®2017_int_peak = Not Run

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro
Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Platform Notes (Continued)

```
      VERSION="12-SP4"
      VERSION_ID="12.4"
      PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
      ID="sles"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:12:sp4"

 uname -a:
    Linux linux 4.12.14-94.41-default #1 SMP Wed Oct 31 12:25:04 UTC 2018 (3090901) x86_64
    x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2017-5754 (Meltdown):          Not affected
 CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation,
 IBPB, IBRS_FW

 run-level 3 Aug 14 11:35

 SPEC is set to: /home/cpu2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda7      xfs   182G  103G   80G  57% /home

 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. 3.1 05/01/2019
   Memory:
    48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
        | 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
```

(Continued on next page)

Compiler Version Notes (Continued)

```
C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
        | 541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.1.144 Build 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`
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`

Supermicro

SuperServer 2049U-TR4
(X11QPH+, Intel Xeon Gold 6248)

SPECrate®2017_int_base = 494

SPECrate®2017_int_peak = Not Run

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-04-02.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-04-02.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revB.xml

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-08-14 14:45:01-0400.
Report generated on 2019-09-03 14:42:35 by CPU2017 PS formatter v6255.
Originally published on 2019-09-03.