



# SPEC® CPU2017 Integer Rate Result

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## Supermicro

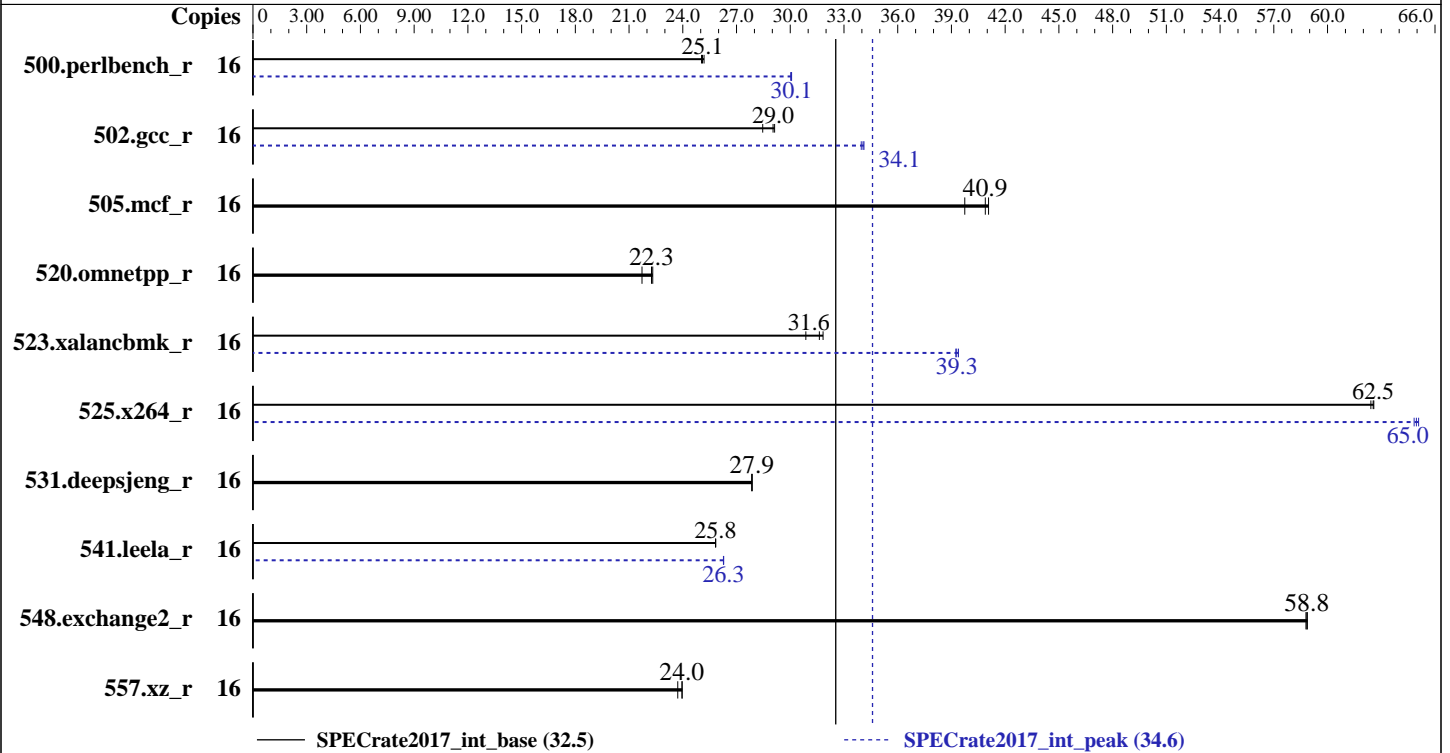
SuperStorage 5049P-E1CR45H (X11SPL-F , Intel Xeon Silver 4108)

SPECrate2017\_int\_base = 32.5

SPECrate2017\_int\_peak = 34.6

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

Test Date: Sep-2018  
Hardware Availability: Jul-2017  
Software Availability: Mar-2018



### Hardware

CPU Name: Intel Xeon Silver 4108  
Max MHz.: 3000  
Nominal: 1800  
Enabled: 8 cores, 1 chip, 2 threads/core  
Orderable: 1 chip  
Cache L1: 32 KB I + 32 KB D on chip per core  
L2: 1 MB I+D on chip per core  
L3: 11 MB I+D on chip per chip  
Other: None  
Memory: 192 GB (6 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)  
Storage: 1 x 200 GB SATA III SSD  
Other: None

### Software

OS: SUSE Linux Enterprise Server 12 SP3 (x86\_64)  
Kernel 4.4.114-94.11-default  
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux;  
Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux  
Parallel: No  
Firmware: Supermicro BIOS version 2.1 released Jun-2018  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other: 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	16	<b><u>1015</u></b>	<b><u>25.1</u></b>	1011	25.2	1017	25.0	16	847	30.1	848	30.0	<b><u>847</u></b>	<b><u>30.1</u></b>
502.gcc_r	16	796	28.5	778	29.1	<b><u>780</u></b>	<b><u>29.0</u></b>	16	664	34.1	<b><u>665</u></b>	<b><u>34.1</u></b>	667	34.0
505.mcf_r	16	651	39.7	<b><u>632</u></b>	<b><u>40.9</u></b>	630	41.1	16	651	39.7	<b><u>632</u></b>	<b><u>40.9</u></b>	630	41.1
520.omnetpp_r	16	966	21.7	<b><u>943</u></b>	<b><u>22.3</u></b>	940	22.3	16	966	21.7	<b><u>943</u></b>	<b><u>22.3</u></b>	940	22.3
523.xalancbmk_r	16	547	30.9	<b><u>534</u></b>	<b><u>31.6</u></b>	531	31.8	16	429	39.4	431	39.2	<b><u>430</u></b>	<b><u>39.3</u></b>
525.x264_r	16	448	62.6	449	62.4	<b><u>448</u></b>	<b><u>62.5</u></b>	16	432	64.8	430	65.1	<b><u>431</u></b>	<b><u>65.0</u></b>
531.deepsjeng_r	16	658	27.9	658	27.9	<b><u>658</u></b>	<b><u>27.9</u></b>	16	658	27.9	658	27.9	<b><u>658</u></b>	<b><u>27.9</u></b>
541.leela_r	16	1026	25.8	1026	25.8	<b><u>1026</u></b>	<b><u>25.8</u></b>	16	1008	26.3	1009	26.3	<b><u>1008</u></b>	<b><u>26.3</u></b>
548.exchange2_r	16	713	58.8	<b><u>712</u></b>	<b><u>58.8</u></b>	712	58.9	16	713	58.8	<b><u>712</u></b>	<b><u>58.8</u></b>	712	58.9
557.xz_r	16	729	23.7	<b><u>721</u></b>	<b><u>24.0</u></b>	721	24.0	16	729	23.7	<b><u>721</u></b>	<b><u>24.0</u></b>	721	24.0

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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 = "/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 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

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.

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### General Notes (Continued)

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

### Platform Notes

BIOS Settings:

LLC prefetch = Enable  
Power Technology = Custom  
Power Performance Tuning = BIOS Controls EPB  
ENERGY\_PERF\_BIAS\_CFG mode = Maximum Performance  
Hardware P-state = Out of Band Mode  
SNC = Enable  
XPT Prefetch = Enable  
Stale AtoS = Enable  
LLC dead line alloc = Disable  
IMC Interleaving = 1-way Interleave  
SDDC Plus One = Disable  
ADDDC Sparing = Disable  
Patrol Scrub = Disable  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-52ma Fri Sep 7 16:18:49 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) Silver 4108 CPU @ 1.80GHz
 1 "physical id"s (chips)
16 "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 0 1 2 3 4 5 6 7
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                16
On-line CPU(s) list:   0-15
Thread(s) per core:    2
Core(s) per socket:    8
```

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### Platform Notes (Continued)

```

Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
Stepping: 4
CPU MHz: 1799.992
BogoMIPS: 3599.98
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-15
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
aperfmpperf 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 hwp_epp intel_pt rsb_ctxsw spec_ctrl 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 : 11264 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 4 5 6 7 8 9 10 11 12 13 14 15
node 0 size: 193020 MB
node 0 free: 192332 MB
node distances:
node 0
0: 10

```

```

From /proc/meminfo
MemTotal: 197652788 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

```

```

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)

```

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### Platform Notes (Continued)

```

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-52ma 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
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: Barriers
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

```

run-level 3 Sep 7 15:42

```

SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   145G   17G  128G  12% /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. 2.1 06/15/2018

Memory:

```

2x NO DIMM NO DIMM
6x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400

```

(End of data from sysinfo program)

### Compiler Version Notes

```

=====
CC 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
    557.xz_r(base)
=====

```

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### Compiler Version Notes (Continued)

icc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====  
CC 500.perlbench\_r(peak) 502.gcc\_r(peak) 505.mcf\_r(peak) 525.x264\_r(peak)  
557.xz\_r(peak)

icc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====  
CXXC 520.omnetpp\_r(base) 523.xalancbmk\_r(base) 531.deepsjeng\_r(base)  
541.leela\_r(base)

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====  
CXXC 520.omnetpp\_r(peak) 523.xalancbmk\_r(peak) 531.deepsjeng\_r(peak)  
541.leela\_r(peak)

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====  
FC 548.exchange2\_r(base)

ifort (IFORT) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====  
FC 548.exchange2\_r(peak)

ifort (IFORT) 18.0.2 20180210  
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### Base Compiler Invocation

C benchmarks:  
icc -m64 -std=c11

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## Base Compiler Invocation (Continued)

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
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

## Peak Compiler Invocation

C benchmarks (except as noted below):

```
icc -m64 -std=c11
```

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## Peak Compiler Invocation (Continued)

```
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
```

## Peak Portability Flags

```
500.perlbenc_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.perlbenc_r: -w1, -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: -w1, -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  
  
525.x264_r: -w1, -z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
```

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## Peak Optimization Flags (Continued)

525.x264\_r (continued):

```
-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: -w1,-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: basepeak = yes

```
541.leela_r: -w1,-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
```

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/Intel-ic18.0-official-linux64.2017-12-21.html>

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml>

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.xml>

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