



# SPEC® CPU2017 Integer Speed Result

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## Supermicro

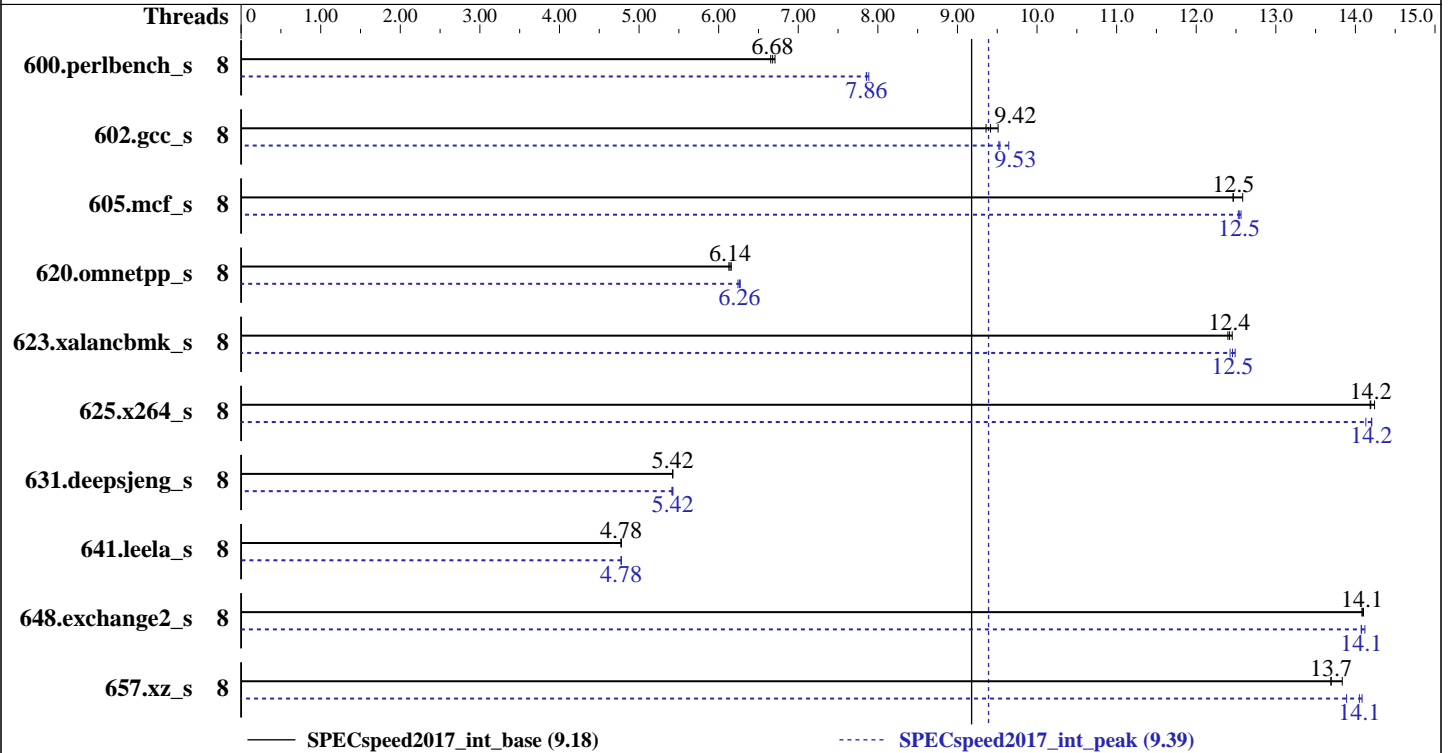
SuperServer 6029U-TR4 (X11DPU , Intel Xeon Platinum 8256)

SPECspeed2017\_int\_base = 9.18

SPECspeed2017\_int\_peak = 9.39

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

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



### Hardware

CPU Name: Intel Xeon Platinum 8256  
Max MHz.: 3900  
Nominal: 3800  
Enabled: 8 cores, 2 chips  
Orderable: 1,2 chips  
Cache L1: 32 KB I + 32 KB D on chip per core  
L2: 1 MB I+D on chip per core  
L3: 16.5 MB I+D on chip per chip  
Other: None  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
Storage: 1 x 200 GB SATA III SSD  
Other: None

### Software

OS: Red Hat Enterprise Linux Server 7.6 (Maipo)  
Kernel 3.10.0-957.el7.x86\_64  
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: Yes  
Firmware: Version 3.0b released Mar-2019  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: jemalloc memory allocator V5.0.1



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## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	8	267	6.65	265	6.71	<b>266</b>	<b>6.68</b>	8	226	7.85	<b>226</b>	<b>7.86</b>	225	7.89
602.gcc_s	8	419	9.51	425	9.36	<b>423</b>	<b>9.42</b>	8	413	9.64	418	9.52	<b>418</b>	<b>9.53</b>
605.mcf_s	8	379	12.5	<b>379</b>	<b>12.5</b>	375	12.6	8	377	12.5	<b>376</b>	<b>12.5</b>	376	12.6
620.omnetpp_s	8	266	6.13	<b>266</b>	<b>6.14</b>	265	6.16	8	<b>260</b>	<b>6.26</b>	260	6.27	261	6.24
623.xalancbmk_s	8	<b>114</b>	<b>12.4</b>	114	12.5	114	12.4	8	113	12.5	<b>114</b>	<b>12.5</b>	114	12.4
625.x264_s	8	124	14.2	<b>124</b>	<b>14.2</b>	124	14.2	8	125	14.1	<b>124</b>	<b>14.2</b>	124	14.2
631.deepsjeng_s	8	264	5.42	264	5.42	<b>264</b>	<b>5.42</b>	8	265	5.41	<b>264</b>	<b>5.42</b>	264	5.42
641.leela_s	8	<b>357</b>	<b>4.78</b>	357	4.77	357	4.78	8	<b>357</b>	<b>4.78</b>	357	4.77	357	4.78
648.exchange2_s	8	208	14.1	209	14.1	<b>209</b>	<b>14.1</b>	8	<b>209</b>	<b>14.1</b>	208	14.1	209	14.1
657.xz_s	8	447	13.8	452	13.7	<b>451</b>	<b>13.7</b>	8	439	14.1	445	13.9	<b>440</b>	<b>14.1</b>

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

## 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:  
KMP\_AFFINITY = "granularity=fine,scatter"  
LD\_LIBRARY\_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"  
OMP\_STACKSIZE = "192M"

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

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.  
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>



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### Platform Notes

BIOS Settings:  
Hyper-Threading = Disable  
LLC prefetch = Disable  
Power Technology = Custom  
Power Performance Tuning = BIOS Controls EPB  
ENERGY\_PERF\_BIAS\_CFG mode = Performance  
Hardware P-state = Out of Band Mode  
XPT Prefetch = Disable  
Stale AtoS = Disable  
LLC dead line alloc = Enable  
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 CPU2017-01 Sun Mar 31 07:33:53 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) Platinum 8256 CPU @ 3.80GHz  
2 "physical id"s (chips)  
8 "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 5 8 9 13  
physical 1: cores 1 2 5 13

From lscpu:  
Architecture: x86\_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 8  
On-line CPU(s) list: 0-7  
Thread(s) per core: 1  
Core(s) per socket: 4  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz  
Stepping: 6

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### Platform Notes (Continued)

CPU MHz: 3800.000  
BogoMIPS: 7600.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 16896K  
NUMA node0 CPU(s): 0-3  
NUMA node1 CPU(s): 4-7

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 epb cat\_l3 cdp\_l3 intel\_ppin intel\_pt ssbd mba ibrs ibpb stibp ibrs\_enhanced 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 avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local dtherm ida arat pln pts hwp\_opp pku ospke avx512\_vnni spec\_ctrl intel\_stibp flush\_l1d arch\_capabilities

```
/proc/cpuinfo cache data
cache size : 16896 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3
node 0 size: 391838 MB
node 0 free: 382967 MB
node 1 cpus: 4 5 6 7
node 1 size: 393216 MB
node 1 free: 384239 MB
node distances:
node  0  1
 0:  10  21
 1:  21  10
```

```
From /proc/meminfo
MemTotal: 791182400 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.6 (Maipo)"
```

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### Platform Notes (Continued)

```
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.6"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.6:ga:server
```

```
uname -a:
Linux CPU2017-01 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018 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: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS
```

```
run-level 3 Mar 31 07:32
```

```
SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdb2       xfs   185G   22G  163G  12% /
```

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. 3.0b 03/04/2019

Memory:

24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)

### Compiler Version Notes

```
====
CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base,
   peak) 657.xz_s(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.
-----
```

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## Compiler Version Notes (Continued)

=====  
CC 600.perlbench\_s(peak) 602.gcc\_s(peak) 605.mcf\_s(peak) 657.xz\_s(peak)  
=====

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.  
=====

=====  
CXXC 620.omnetpp\_s(base) 623.xalancbmk\_s(base, peak) 631.deepsjeng\_s(base,  
peak) 641.leela\_s(base, peak)  
=====

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.  
=====

=====  
CXXC 620.omnetpp\_s(peak)  
=====

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.  
=====

=====  
FC 648.exchange2\_s(base, peak)  
=====

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



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## Base Portability Flags

```
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```

## Base Optimization Flags

C benchmarks:

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

Fortran benchmarks:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs
```

## Peak Compiler Invocation

C benchmarks:

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

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```



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## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2  
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3  
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -fno-strict-overflow  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
602.gcc_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2  
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3  
-no-prec-div -DSPEC_SUPPRESS_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
605.mcf_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4  
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
625.x264_s: -w1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
657.xz_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2  
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3  
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc
```

C++ benchmarks:

```
620.omnetpp_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4  
-DSPEC_SUPPRESS_OPENMP  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64  
-lqkmalloc
```

```
623.xalancbmk_s: -w1,-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
```

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## Peak Optimization Flags (Continued)

631.deepsjeng\_s: Same as 623.xalancbmk\_s

641.leela\_s: Same as 623.xalancbmk\_s

Fortran benchmarks:

-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs

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

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-02.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-linux64.2019-04-02.xml>

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

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