



# SPEC CPU®2017 Integer Rate Result

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## xFusion

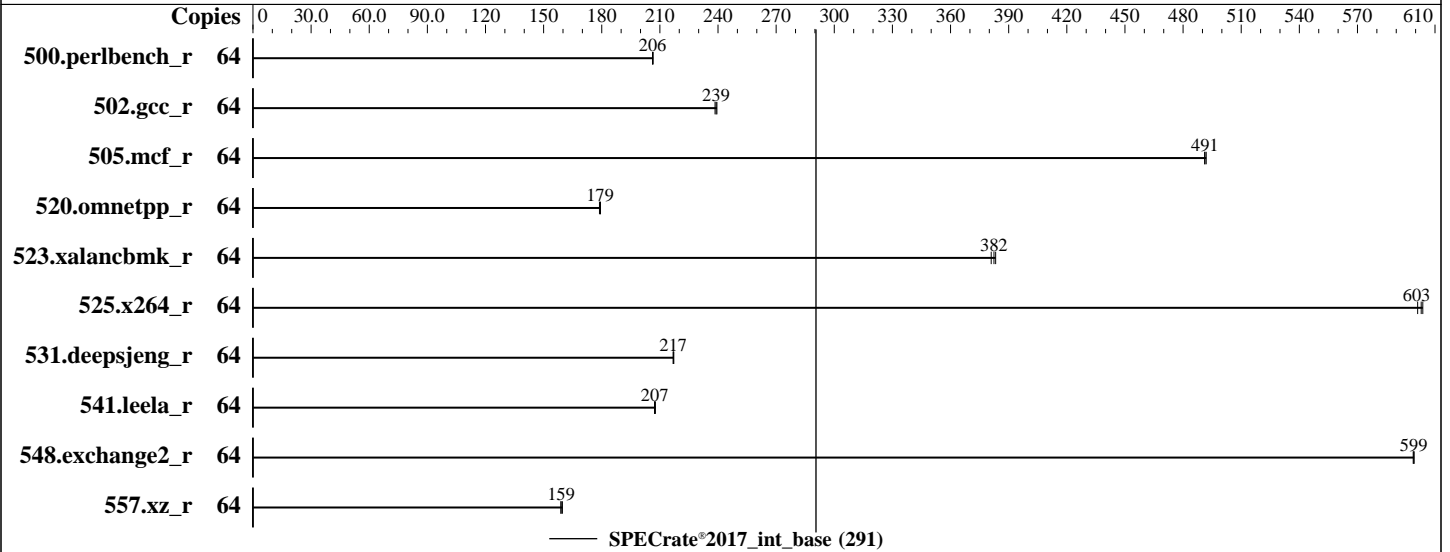
SPECrate®2017\_int\_base = 291

### xFusion 5288 V6 (Intel Xeon Gold 6346)

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 6488  
Test Sponsor: xFusion  
Tested by: xFusion

Test Date: Apr-2022  
Hardware Availability: Apr-2021  
Software Availability: Sep-2021



### Hardware

CPU Name: Intel Xeon Gold 6346  
Max MHz: 3600  
Nominal: 3100  
Enabled: 32 cores, 2 chips, 2 threads/core  
Orderable: 1,2 chips  
Cache L1: 32 KB I + 48 KB D on chip per core  
L2: 1.25 MB I+D on chip per core  
L3: 36 MB I+D on chip per chip  
Other: None  
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
Storage: 1 x 960 GB SATA SSD  
Other: None

### Software

OS: Red Hat Enterprise Linux release 8.4 (Ootpa) 4.18.0-305.el8.x86\_64  
Compiler: C/C++: Version 2021.4 of Intel oneAPI DPC++/C++ Compiler Build 20210924 for Linux; Fortran: Version 2021.4 of Intel Fortran Compiler Classic Build 20210910 for Linux  
Parallel: No  
Firmware: Version 0.95 Released Dec-2021  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: Not Applicable  
Other: None  
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage



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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	64	<b>494</b>	<b>206</b>	494	206	493	207							
502.gcc_r	64	<b>379</b>	<b>239</b>	379	239	380	238							
505.mcf_r	64	211	491	210	492	<b>211</b>	<b>491</b>							
520.omnetpp_r	64	<b>469</b>	<b>179</b>	468	179	470	179							
523.xalancbmk_r	64	177	381	<b>177</b>	<b>382</b>	176	383							
525.x264_r	64	186	604	<b>186</b>	<b>603</b>	186	601							
531.deepsjeng_r	64	<b>338</b>	<b>217</b>	338	217	338	217							
541.leela_r	64	<b>511</b>	<b>207</b>	510	208	511	207							
548.exchange2_r	64	<b>280</b>	<b>599</b>	280	599	280	599							
557.xz_r	64	<b>435</b>	<b>159</b>	433	160	435	159							

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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"

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
LD\_LIBRARY\_PATH =  
"/spec2017/lib/intel64:/spec2017/lib/ia32:/spec2017/je5.0.1-32"  
MALLOC\_CONF = "retain:true"

### General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4  
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.:

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### General Notes (Continued)

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) is mitigated in the system as tested and documented.

### Platform Notes

BIOS configuration:  
Performance Profile Set to Performance  
SNC Set to Enabled SNC2 (2-clusters)

Sysinfo program /spec2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d  
running on localhost.localdomain Sun Apr 17 00:42:45 2022

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 6346 CPU @ 3.10GHz  
2 "physical id"s (chips)  
64 "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 : 16  
siblings : 32  
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu from util-linux 2.32.1:  
Architecture: x86\_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 64  
On-line CPU(s) list: 0-63  
Thread(s) per core: 2  
Core(s) per socket: 16  
Socket(s): 2  
NUMA node(s): 4  
Vendor ID: GenuineIntel  
BIOS Vendor ID: Intel(R) Corporation  
CPU family: 6

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## Platform Notes (Continued)

```

Model: 106
Model name: Intel(R) Xeon(R) Gold 6346 CPU @ 3.10GHz
BIOS Model name: Intel(R) Xeon(R) Gold 6346 CPU @ 3.10GHz
Stepping: 6
CPU MHz: 3600.000
BogoMIPS: 6200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s): 0-8,32-40
NUMA node1 CPU(s): 9-15,41-47
NUMA node2 CPU(s): 16-23,48-55
NUMA node3 CPU(s): 24-31,56-63
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 pdpelt rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfperf pni pclmulqdq dtes64 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 ept cat_l3 invpcid_single ssbd mba ibrs
ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase
tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed
adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
split_lock_detect wbnoinvd dtherm ida arat pln pts hwp_epp avx512vbmi umip pku ospke
avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq
la57 rdpid fsrm md_clear pconfig flush_lld arch_capabilities

```

```

/proc/cpuinfo cache data
cache size : 36864 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 2 3 4 5 6 7 8 32 33 34 35 36 37 38 39 40
node 0 size: 128116 MB
node 0 free: 127282 MB
node 1 cpus: 9 10 11 12 13 14 15 41 42 43 44 45 46 47
node 1 size: 129020 MB
node 1 free: 128656 MB
node 2 cpus: 16 17 18 19 20 21 22 23 48 49 50 51 52 53 54 55
node 2 size: 129020 MB
node 2 free: 128763 MB
node 3 cpus: 24 25 26 27 28 29 30 31 56 57 58 59 60 61 62 63
node 3 size: 129017 MB
node 3 free: 128751 MB

```

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### Platform Notes (Continued)

node distances:

node	0	1	2	3
0:	10	11	20	20
1:	11	10	20	20
2:	20	20	10	11
3:	20	20	11	10

From /proc/meminfo

MemTotal: 527539912 kB  
HugePages\_Total: 0  
Hugepagesize: 2048 kB

/sbin/tuned-adm active

Current active profile: throughput-performance

From /etc/\*release\* /etc/\*version\*

os-release:

NAME="Red Hat Enterprise Linux"  
VERSION="8.4 (Ootpa)"  
ID="rhel"  
ID\_LIKE="fedora"  
VERSION\_ID="8.4"  
PLATFORM\_ID="platform:el8"  
PRETTY\_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"  
ANSI\_COLOR="0;31"

redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)

system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)

system-release-cpe: cpe:/o:redhat:enterprise\_linux:8.4:ga

uname -a:

Linux localhost.localdomain 4.18.0-305.el8.x86\_64 #1 SMP Thu Apr 29 08:54:30 EDT 2021  
x86\_64 x86\_64 x86\_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):	Not affected
CVE-2018-3620 (L1 Terminal Fault):	Not affected
Microarchitectural Data Sampling:	Not affected
CVE-2017-5754 (Meltdown):	Not affected
CVE-2018-3639 (Speculative Store Bypass):	Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):	Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

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### Platform Notes (Continued)

CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected  
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Apr 17 00:40

SPEC is set to: /spec2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	xfs	420G	74G	346G	18%	/

From /sys/devices/virtual/dmi/id

Vendor: XFUSION  
Product: 5288 V6  
Product Family: Whitley  
Serial: 1234567

Additional information from dmidecode 3.2 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.

Memory:

12x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200  
4x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:

BIOS Vendor: INSYDE Corp.  
BIOS Version: 0.95  
BIOS Date: 12/22/2021  
BIOS Revision: 0.95

(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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.4.0 Build 20210924  
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

```

=====
C++   | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      | 541.leela_r(base)
=====

```

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## Compiler Version Notes (Continued)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.4.0 Build 20210924  
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.

-----  
Fortran | 548.exchange2\_r(base)

-----  
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.4.0 Build 20210910\_000000  
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.  
-----

## Base Compiler Invocation

C benchmarks:  
icx

C++ benchmarks:  
icpx

Fortran benchmarks:  
ifort

## 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:  
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math

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## Base Optimization Flags (Continued)

C benchmarks (continued):

```
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries  
-L/usr/local/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin  
-lqkmalloc
```

C++ benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries  
-L/usr/local/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin  
-lqkmalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div  
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte  
-auto -mbranches-within-32B-boundaries  
-L/usr/local/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin  
-lqkmalloc
```

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

[http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64\\_revA.html](http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html)  
<http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-ICX-V1.1.html>

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

[http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64\\_revA.xml](http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml)  
<http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-ICX-V1.1.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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