# SPEC CPU®2017 Integer Rate Result

## xFusion

**xFusion 5288 V6 (Intel Xeon Gold 6338)**

**SPECrate®2017_int_base = 425**

**SPECrate®2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>CPU2017 License: 6488</th>
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</tr>
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<tr>
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<td>Hardware Availability: Apr-2021</td>
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<td>Software Availability: May-2021</td>
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<tr>
<th>Copies</th>
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<tr>
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<td>557.xz_r</td>
<td>128</td>
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</table>

### Hardware

**CPU Name:** Intel Xeon Gold 6338  
**Max MHz:** 3200  
**Nominal:** 2000  
**Enabled:** 64 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:** 48 MB I+D on chip per chip  
**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)  
**Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
**Compiler Build:** 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 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

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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"
MALLOCONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1
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>

(Continued on next page)
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General Notes (Continued)
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 Thu Mar 31 12:20:48 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 6338 CPU @ 2.00GHz
 2 "physical id"s (chips)
 128 "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 : 32
  siblings : 64
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
             25 26 27 28 29 30 31
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
             25 26 27 28 29 30 31

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):         128
On-line CPU(s) list: 0-127
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s):      2
NUMA node(s):   4
Vendor ID:      GenuineIntel
BIOS Vendor ID: Intel(R) Corporation

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Platform Notes (Continued)

CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
BIOS Model name: Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
Stepping: 6
CPU MHz: 2600.000
BogoMIPS: 4000.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s): 0-15,64-79
NUMA node1 CPU(s): 16-31,80-95
NUMA node2 CPU(s): 32-47,96-111
NUMA node3 CPU(s): 48-63,112-127
Flags: fpu vme de pse tsc msr pae 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 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 3nowprefetch cpuid_fault epb 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 erts invpcid cmpq rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local split_lock_detect wbnoinvd dtherm ida arat pln pts hwp_epp avx512vbm12 umip pku ospke avx512_vbmi2 gfn ga vaes vpcmvdq avx512_vnni avx512_bitalg mte avx512_vpopcntdq lal57 rdpid md_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data
cache size : 49152 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 9 10 11 12 13 14 15 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 0 size: 128151 MB
node 0 free: 127296 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
node 1 size: 128017 MB
node 1 free: 128458 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111
node 2 size: 128979 MB

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Platform Notes (Continued)

node 2 free: 128434 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127
node 3 size: 129014 MB
node 3 free: 128537 MB
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: 527527236 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

(Continued on next page)
Platform Notes (Continued)

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

run-level 3 Mar 31 12:18
SPEC is set to: /spec2017
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   420G   19G  402G   5% /

From /sys/devices/virtual/dmi/id
Vendor:        XFUSION
Product:       5288 V6
Product Family: Whitley
Serial:        123456

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:
  16x 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)
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**Compiler Version Notes (Continued)**

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**C++**

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

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113

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**Fortran**

| 548.exchange2_r(base) |

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Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000

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**Base Compiler Invocation**

*C* benchmarks:

icx

*C++* benchmarks:

icpx

*Fortran* benchmarks:

ifort

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**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  
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557.xz_r: -DSPEC_LP64
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### Base Optimization Flags

**C benchmarks:**

- `-w`  
- `-std=c11`  
- `-m64`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-O3`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries`  
- `-L/opt/intel/oneapi/compiler/2021.1.1/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/opt/intel/oneapi/compiler/2021.1.1/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/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`  
- `-lqkmalloc`

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

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

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