# SPEC CPU®2017 Integer Rate Result

**xFusion**

**xFusion 2288H V5 (Intel Xeon Gold 6230R)**

<table>
<thead>
<tr>
<th>SPECram®2017_int_base =</th>
<th>318</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECram®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

## CPU2017 License

- **License:** 6488
- **Test Date:** Mar-2022
- **Test Sponsor:** xFusion
- **Hardware Availability:** Feb-2020
- **Tested by:** xFusion
- **Software Availability:** May-2021
- **Test Date:** Mar-2022
- **Software Availability:** May-2021

<table>
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<tr>
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<td></td>
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<tr>
<td>Parallels: No</td>
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## Performance

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
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</tr>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>104</td>
<td>318</td>
</tr>
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</tr>
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## CPU Name

- **Name:** Intel Xeon Gold 6230R
- **Max MHz:** 4000
- **Nominal:** 2100
- **Enabled:** 52 cores, 2 chips, 2 threads/core
- **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:** 35.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 960 GB SATA SSD
- **Other:** None

## Test Sponsor

- **xFusion**

## Hardware Availability

- **Feb-2020**
- **May-2021**

## Tested by

- **xFusion**

## Software Availability

- **May-2021**

## Test Date

- **Mar-2022**
Results Table

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<tr>
<th>Benchmark</th>
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<td>579</td>
<td>194</td>
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**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"
MALLOC_CONF = "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)
### xFusion

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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:
  - Power Policy Set to Performance
  - SNC Set to Enabled
  - IMC Interleaving set to 1-way interleave
  - XPT Prefetch set to Enabled

- Sysinfo program /spec2017/bin/sysinfo
  - Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d
  - running on localhost.localdomain Wed Mar 30 15:27:00 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 6230R CPU @ 2.10GHz
  104 "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 : 26
  siblings : 52
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
  ```

- 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): 104
  On-line CPU(s) list: 0-103
  Thread(s) per core: 2
  Core(s) per socket: 26
  Socket(s): 2
  NUMA node(s): 4
  ```

(Continued on next page)
**Platform Notes (Continued)**

Vendor ID:          GenuineIntel
BIOS Vendor ID:     Intel(R) Corporation
CPU family:        6
Model:             85
Model name:        Intel(R) Xeon(R) Gold 6230R CPU @ 2.10GHz
BIOS Model name:   Intel(R) Xeon(R) Gold 6230R CPU @ 2.10GHz
Stepping:          7
CPU MHz:           3000.010
CPU max MHz:       4000.0000
CPU min MHz:       1000.0000
BogoMIPS:          4200.00
Virtualization:    VT-x
L1d cache:         32K
L1i cache:         32K
L2 cache:          1024K
L3 cache:          36608K
NUMA node0 CPU(s): 0-3,7-9,13-15,20-22,52-55,59-61,65-67,72-74
NUMA node1 CPU(s): 4-6,10-12,16-19,23-25,56-58,62-64,68-71,75-77
NUMA node2 CPU(s): 26-29,33-35,39-41,46-48,78-81,85-87,91-93,98-100
NUMA node3 CPU(s): 30-32,36-38,42-45,49-51,82-84,88-90,94-97,101-103
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 aperfmerf pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3
                    sdbg fma cx16 xpaging pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
                    tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch
                    pdcm pclmulqdq dtes64 msr pcrm cpb 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 pdcm pclmulqdq dtes64
                    msr pcrm cpb 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 pdcm pclmulqdq dtes64 msr pcrm cpb 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 pdcm pclmulqdq dtes64 msr pcrm cpb 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
                    pdcm pclmulqdq dtes64 msr pcrm cpb ds_cpl vmx smx est tm2 ssse3 sdbg fma
cache data
                    cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer
                    aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch pdcm pclmulqdq dtes64
                    msr pcrm cpb ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid
cache size : 36608 KB

From `numactl --hardware`
WARNING: a numa11 'node' might or might not correspond to a physical chip.

```plaintext
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 7 8 9 13 14 15 20 21 22 52 53 54 55 59 60 61 65 66 67 72 73 74
node 0 size: 191707 MB
node 0 free: 185486 MB
node 1 cpus: 4 5 6 10 11 12 16 17 18 19 23 24 25 56 57 58 62 63 64 68 69 70 71 75 76 77
node 1 size: 193493 MB
node 1 free: 193076 MB
node 2 cpus: 26 27 28 29 33 34 35 39 40 41 46 47 48 78 79 80 81 85 86 87 91 92 93 98 99
node 2 size: 193530 MB
```

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(Continued on next page)
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CPU2017 License: 6488
Test Sponsor: xFusion
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Platform Notes (Continued)

node 2 free: 192143 MB
node 3 cpus: 30 31 32 36 37 38 42 43 44 45 49 50 51 82 83 84 88 89 90 94 95 96 97 101 102 103
node 3 size: 193529 MB
node 3 free: 193064 MB
node distances:
node 0 1 2 3
0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 790795000 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sbin/tuned-adm active
Current active profile: throughput-performance
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has 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): KVM: Mitigation: Split huge pages
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected

(Continued on next page)
xFusion

xFusion 2288H V5 (Intel Xeon Gold 6230R)

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- **SPECrade®2017_int_base = 318**
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**CPU2017 License:** 6488  
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---

**Platform Notes (Continued)**

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

```
run-level 3 Mar 30 15:26
```

**SPEC is set to:** /spec2017

```plaintext
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   859G  127G  733G  15% /
```

---

**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:**
- 22x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933
- 2x Hynix HMA84GR7JJR4N-WM 32 GB 2 rank 2933

**BIOS:**
- BIOS Vendor: INSYDE Corp.
- BIOS Version: 8.23
- BIOS Date: 12/30/2021
- BIOS Revision: 8.23

(End of data from sysinfo program)

---

**Compiler Version Notes**

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

(Continued on next page)```
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Compiler Version Notes (Continued)

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 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 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 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

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**SPECrate®2017_int_base = 318**

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---

### Base Portability Flags (Continued)

- 557.xz_r: -DSPEC_LP64

### 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`

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

Tested with SPEC CPU®2017 v1.1.8 on 2022-03-30 15:26:59-0400.


Originally published on 2022-04-27.