# SPEC CPU®2017 Integer Rate Result

## xFusion

xFusion 5288 V5 (Intel Xeon Platinum 8260)

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: Red Hat Enterprise Linux release 8.4 (Ootpa) 4.18.0-305.el8.x86_64</td>
<td>CPU Name: Intel Xeon Platinum 8260</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 2021.4.0 of Intel oneAPI DPC++/C++ Compiler Build 20210924 for Linux; Fortran: Version 2021.4.0 of Intel Fortran Compiler Classic Build 20210910 for Linux</td>
<td>Max MHz: 3900</td>
</tr>
<tr>
<td>Firmware: Version 8.23 Released Dec-2021</td>
<td>Enabled: 48 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>Orderable: 1.2 chips</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>L2: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: Not Applicable</td>
<td>L3: 35.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: None</td>
</tr>
<tr>
<td>Power Management: BIOS and OS set to prefer performance at the cost of additional power usage</td>
<td></td>
</tr>
</tbody>
</table>

## SPECrate®2017_int_base = 290

| SPECrate®2017_int_peak = Not Run |

### Copies

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<td>502.gcc_r 96</td>
</tr>
<tr>
<td>505.mcf_r 96</td>
</tr>
<tr>
<td>520.omnetpp_r 96</td>
</tr>
<tr>
<td>523.xalancbmk_r 96</td>
</tr>
<tr>
<td>525.x264_r 96</td>
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<tr>
<td>531.deepsjeng_r 96</td>
</tr>
<tr>
<td>541.leela_r 96</td>
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<tr>
<td>548.exchange2_r 96</td>
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<tr>
<td>557.xz_r 96</td>
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</table>

### Test Date: Apr-2022

| Hardware Availability: Apr-2019 |
| Software Availability: Sep-2021 |

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (290)</th>
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<tbody>
<tr>
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<tr>
<td>CPU2017 License: 6488</td>
</tr>
<tr>
<td>Test Sponsor: xFusion</td>
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<tr>
<td>Tested by: xFusion</td>
</tr>
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<td>Test Date: Apr-2022</td>
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<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>L3: 35.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
<tr>
<td>Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)</td>
</tr>
<tr>
<td>Storage: 1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
</tbody>
</table>
Results Table

<table>
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<tr>
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<th>Seconds</th>
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<td>587</td>
<td>177</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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 = 
    
    
    
MALLOCONF = "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.: (Continued on next page)
xFusion

xFusion 5288 V5 (Intel Xeon Platinum 8260)

| SPECrate®2017_int_base = | 290 |
| SPECrate®2017_int_peak = | Not Run |

**CPU2017 License:** 6488  
**Test Sponsor:** xFusion  
**Tested by:** xFusion  
**Test Date:** Apr-2022  
**Hardware Availability:** Apr-2019  
**Software Availability:** Sep-2021

---

**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:
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 982a61ec0915b55891ef0e16acaf64d  
running on localhost.localdomain Sun Apr 24 00:40:06 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) Platinum 8260 CPU @ 2.40GHz
  2 "physical id"s (chips)
  96 "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 : 24
  siblings : 48
  physical 0: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 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 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):                96
On-line CPU(s) list:   0-95
Thread(s) per core:    2
Core(s) per socket:    24
Socket(s):             2
NUMA node(s):          4
Vendor ID:             GenuineIntel
```

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

xFusion

xFusion 5288 V5 (Intel Xeon Platinum 8260)

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

SPECrater®2017_int_base = 290
SPECrater®2017_int_peak = Not Run

Test Date: Apr-2022
Hardware Availability: Apr-2019
Software Availability: Sep-2021

Platform Notes (Continued)

BIOS Vendor ID: Intel(R) Corporation
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8260 CPU @ 2.40GHz
BIOS Model name: Intel(R) Xeon(R) Platinum 8260 CPU @ 2.40GHz
Stepping: 7
CPU MHz: 3100.009
CPU max MHz: 3900.000
CPU min MHz: 1000.000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3,7,8,12-14,18-20,48-51,55,56,60-62,66-68
NUMA node1 CPU(s): 4-6,9-11,15-17,21-23,52-54,55,57-59,63-65,69-71
NUMA node2 CPU(s): 24-27,31-33,37-39,43,44,72-75,79-81,85-87,91,92
NUMA node3 CPU(s): 28-30,34-36,40-42,44,45-47,76-78,82,84,88-90,93-95

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
aperfmerge pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 sse3 sdbg fma cx16 xptr pdcm
pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd
mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmlinux flexpriority ept vpid ept_ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cmx mpx rdt_a avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsavesopt xsaveopt xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

/proc/cpuinfo  cache
size: 36608 KB

From numacl --hardware
WARNING: a numacl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 7 8 12 13 14 18 19 20 48 49 50 51 55 56 60 61 62 66 67 68
node 0 size: 191708 MB
node 0 free: 185471 MB
node 1 cpus: 4 5 6 9 10 11 15 16 17 21 22 23 52 53 54 57 58 59 63 64 65 69 70 71
node 1 size: 193530 MB
node 1 free: 193084 MB
node 2 cpus: 24 25 26 27 31 32 33 37 38 39 43 44 72 73 74 75 79 80 81 85 86 87 91 92
node 2 size: 193530 MB
node 2 free: 192112 MB
node 3 cpus: 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 89 90 93 94 95

(Continued on next page)
xFusion

xFusion 5288 V5 (Intel Xeon Platinum 8260)

| SPECrate®2017_int_base = 290 |
| SPECrate®2017_int_peak = Not Run |

CPU2017 License: 6488  
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Software Availability: Sep-2021

Platform Notes (Continued)

node 3 size: 193493 MB  
node 3 free: 193154 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: 790796732 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):  
CVE-2018-3620 (L1 Terminal Fault):  
Microarchitectural Data Sampling:  
CVE-2017-5754 (Meltdown):  
CVE-2018-3639 (Speculative Store Bypass):
  KVM: Mitigation: Split huge pages  
  Not affected  
  Not affected  
  Not affected  
  Mitigation: Speculative Store Bypass disabled via prctl and seccomp

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

**xFusion**

**xFusion 5288 V5 (Intel Xeon Platinum 8260)**

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**CPU2017 License:** 6488

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### 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):**
  - Mitigation: TSX disabled

---

**run-level 3 Apr 24 00:39**

**SPEC is set to:** /spec2017

**Filesystem**

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>xfs</td>
<td>859G</td>
<td>30G</td>
<td>830G</td>
<td>4%</td>
<td>/</td>
</tr>
</tbody>
</table>

**From /sys/devices/virtual/dmi/id**

- **Vendor:** XFUSION
- **Product:** 5288 V5
- **Product Family:** Purley
- **Serial:** Serial

**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

---

### Compiler Version Notes

```
==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)</th>
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<tr>
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<td>525.x264_r(base) 557.xz_r(base)</td>
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==============================================================================
```

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.

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**Compiler Version Notes (Continued)**

```
==============================================================================
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 2021.4.0 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  
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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/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/xFusion-Platform-Settings-CSL-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/xFusion-Platform-Settings-CSL-V1.1.xml

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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 2022-04-24 00:40:05-0400.