



SPEC CPU®2017 Integer Rate Result

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xFusion

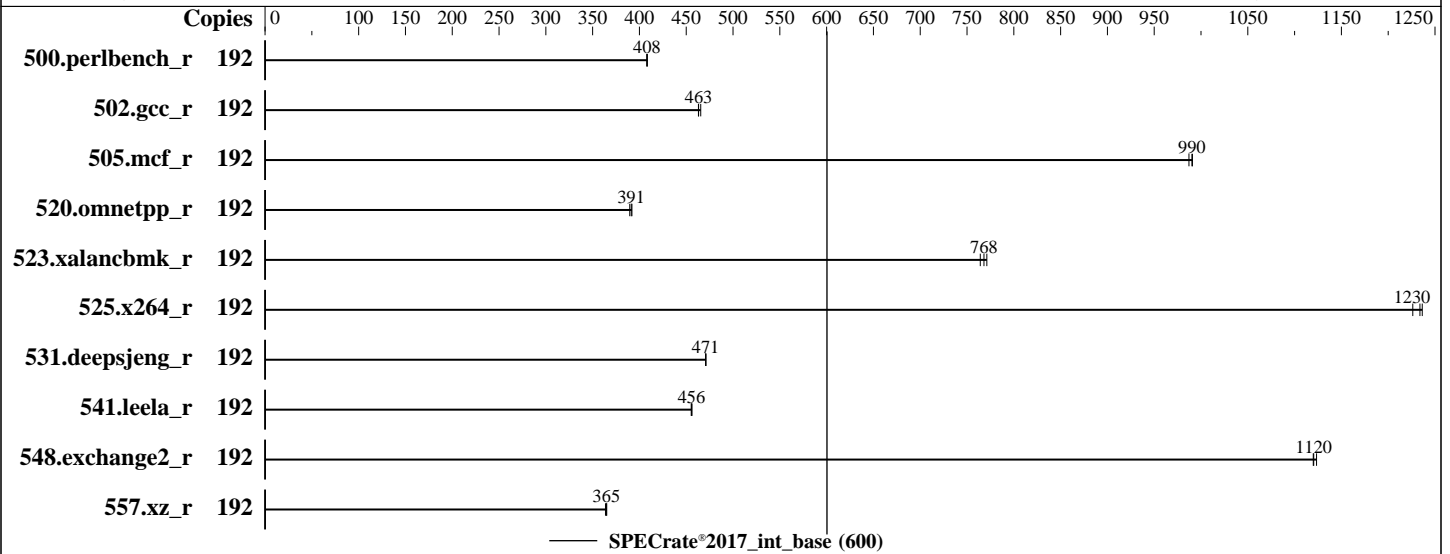
SPECrate®2017_int_base = 600

xFusion 2488H V5 (Intel Xeon Gold 6252N)

SPECrate®2017_int_peak = Not Run

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

Test Date: Mar-2022
Hardware Availability: Apr-2019
Software Availability: Jun-2021



Hardware

CPU Name: Intel Xeon Gold 6252N
Max MHz: 3600
Nominal: 2300
Enabled: 96 cores, 4 chips, 2 threads/core
Orderable: 2,4 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 (48 x 16 GB 2Rx8 PC4-2933Y-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 2021.1 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 7.87 Released Nov-2020
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	192	749	408	748	408	749	408									
502.gcc_r	192	587	463	587	463	584	465									
505.mcf_r	192	314	987	313	990	313	991									
520.omnetpp_r	192	644	391	646	390	643	392									
523.xalancbmk_r	192	264	768	263	771	265	764									
525.x264_r	192	272	1230	272	1240	274	1230									
531.deepsjeng_r	192	467	471	467	471	467	471									
541.leela_r	192	698	456	698	455	697	456									
548.exchange2_r	192	449	1120	449	1120	448	1120									
557.xz_r	192	568	365	569	365	570	364									

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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 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.:

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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:
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 982a61ec0915b55891ef0e16acafc64d  
running on localhost.localdomain Sat Mar 5 07:03:52 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 6252N CPU @ 2.30GHz  
4 "physical id"s (chips)  
192 "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 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29  
physical 1: cores 0 1 2 3 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 25 26 27 28 29  
physical 2: cores 0 1 2 3 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 25 26 27 28 29  
physical 3: 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
```

```
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): 192  
On-line CPU(s) list: 0-191  
Thread(s) per core: 2  
Core(s) per socket: 24  
Socket(s): 4
```

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Platform Notes (Continued)

```

NUMA node(s):      8
Vendor ID:         GenuineIntel
BIOS Vendor ID:   Intel(R) Corporation
CPU family:        6
Model:             85
Model name:        Intel(R) Xeon(R) Gold 6252N CPU @ 2.30GHz
BIOS Model name:   Intel(R) Xeon(R) Gold 6252N CPU @ 2.30GHz
Stepping:          7
CPU MHz:           3000.001
CPU max MHz:       3600.0000
CPU min MHz:       1000.0000
BogoMIPS:          4600.00
Virtualization:    VT-x
L1d cache:         32K
L1i cache:         32K
L2 cache:          1024K
L3 cache:          36608K
NUMA node0 CPU(s): 0-3,7-9,13-15,19,20,96-99,103-105,109-111,115,116
NUMA node1 CPU(s): 4-6,10-12,16-18,21-23,100-102,106-108,112-114,117-119
NUMA node2 CPU(s): 24-27,30-32,36-38,43,44,120-123,126-128,132-134,139,140
NUMA node3 CPU(s): 28,29,33-35,39-42,45-47,124,125,129-131,135-138,141-143
NUMA node4 CPU(s): 48-51,54-56,60-62,67,68,144-147,150-152,156-158,163,164
NUMA node5 CPU(s): 52,53,57-59,63-66,69-71,148,149,153-155,159-162,165-167
NUMA node6 CPU(s): 72-75,79,80,84-86,90-92,168-171,175,176,180-182,186-188
NUMA node7 CPU(s): 76-78,81-83,87-89,93-95,172-174,177-179,183-185,189-191
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
aperfmpperf 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 epb cat_l3 cdp_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 rtm cqm mpx rdt_a avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_lld arch_capabilities

```

```
/proc/cpuinfo cache data
cache size : 36608 KB
```

From numactl --hardware

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

available: 8 nodes (0-7)

node 0 cpus: 0 1 2 3 7 8 9 13 14 15 19 20 96 97 98 99 103 104 105 109 110 111 115 116

node 0 size: 94939 MB

node 0 free: 88755 MB

node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 100 101 102 106 107 108 112 113 114 117

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Platform Notes (Continued)

```

118 119
node 1 size: 96762 MB
node 1 free: 96520 MB
node 2 cpus: 24 25 26 27 30 31 32 36 37 38 43 44 120 121 122 123 126 127 128 132 133
134 139 140
node 2 size: 96725 MB
node 2 free: 95182 MB
node 3 cpus: 28 29 33 34 35 39 40 41 42 45 46 47 124 125 129 130 131 135 136 137 138
141 142 143
node 3 size: 96762 MB
node 3 free: 96323 MB
node 4 cpus: 48 49 50 51 54 55 56 60 61 62 67 68 144 145 146 147 150 151 152 156 157
158 163 164
node 4 size: 96762 MB
node 4 free: 96517 MB
node 5 cpus: 52 53 57 58 59 63 64 65 66 69 70 71 148 149 153 154 155 159 160 161 162
165 166 167
node 5 size: 96762 MB
node 5 free: 96420 MB
node 6 cpus: 72 73 74 75 79 80 84 85 86 90 91 92 168 169 170 171 175 176 180 181 182
186 187 188
node 6 size: 96762 MB
node 6 free: 96407 MB
node 7 cpus: 76 77 78 81 82 83 87 88 89 93 94 95 172 173 174 177 178 179 183 184 185
189 190 191
node 7 size: 96760 MB
node 7 free: 96512 MB
node distances:
node  0  1  2  3  4  5  6  7
  0: 10 11 21 21 21 21 21 21
  1: 11 10 21 21 21 21 21 21
  2: 21 21 10 11 21 21 21 21
  3: 21 21 11 10 21 21 21 21
  4: 21 21 21 21 10 11 21 21
  5: 21 21 21 21 11 10 21 21
  6: 21 21 21 21 21 21 10 11
  7: 21 21 21 21 21 21 11 10

```

```

From /proc/meminfo
MemTotal:      790772828 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

```

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Platform Notes (Continued)

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

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):

Vulnerable: Clear CPU buffers attempted, no microcode; SMT vulnerable

run-level 3 Mar 5 06:57

SPEC is set to: /spec2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda3	xfs	859G	102G	758G	12%	/

From /sys/devices/virtual/dmi/id

Vendor: serial

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Platform Notes (Continued)

Product: 2488H V5
Product Family: Purley
Serial: serial

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:
48x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

BIOS:
BIOS Vendor: INSYDE Corp.
BIOS Version: 7.87
BIOS Date: 11/26/2020
BIOS Revision: 7.87

(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 2021.1 Build 20201113
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.



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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
-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
```

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmallocc
```

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/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.

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