



# SPEC CPU®2017 Integer Rate Result

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Inspur Corporation Inspur NF5280M6 (Intel Xeon Platinum 8380)	SPECrate®2017 int base = 565 SPECrate®2017 int peak = 588
<b>CPU2017 License:</b> 3358	<b>Test Date:</b> Apr-2021
<b>Test Sponsor:</b> Inspur Corporation	<b>Hardware Availability:</b> Apr-2021
<b>Tested by:</b> Inspur Corporation	<b>Software Availability:</b> Feb-2021

Benchmark result graphs are available in the [PDF report](#).

Hardware	Software
<p><b>CPU Name:</b> Intel Xeon Platinum 8380</p> <p><b>Max MHz:</b> 3400</p> <p><b>Nominal:</b> 2300</p> <p><b>Enabled:</b> 80 cores, 2 chips, 2 threads/core</p> <p><b>Orderable:</b> 1,2 chips</p> <p><b>Cache L1:</b> 32 KB I + 48 KB D on chip per core</p> <p><b>L2:</b> 1.25 MB I+D on chip per core</p> <p><b>L3:</b> 60 MB I+D on chip per chip</p> <p><b>Other:</b> None</p> <p><b>Memory:</b> 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)</p> <p><b>Storage:</b> 1 x 4 TB NVME SSD</p> <p><b>Other:</b> None</p>	<p><b>OS:</b> Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64</p> <p><b>Compiler:</b> C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux</p> <p><b>Parallel:</b> No</p> <p><b>Firmware:</b> Version 4.08.00 released Apr-2021</p> <p><b>File System:</b> xfs</p> <p><b>System State:</b> Run level 3 (multi-user)</p> <p><b>Base Pointers:</b> 64-bit</p> <p><b>Peak Pointers:</b> 32/64-bit</p> <p><b>Other:</b> jemalloc memory allocator V5.0.1</p> <p><b>Power Management:</b> BIOS and OS set to prefer performance at the cost of additional power usage.</p>

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	160	<b>627</b>	<b>406</b>	627	406	627	406	160	535	476	536	475	<b>536</b>	<b>476</b>
502.gcc_r	160	548	413	<b>547</b>	<b>414</b>	547	414	160	439	516	440	515	<b>440</b>	<b>515</b>
505.mcf_r	160	288	897	<b>288</b>	<b>898</b>	287	900	160	288	897	<b>288</b>	<b>898</b>	287	900
520.omnetpp_r	160	673	312	671	313	<b>672</b>	<b>312</b>	160	673	312	671	313	<b>672</b>	<b>312</b>
523.xalancbmk_r	160	235	718	<b>236</b>	<b>716</b>	236	715	160	235	718	<b>236</b>	<b>716</b>	236	715
525.x264_r	160	<b>226</b>	<b>1240</b>	226	1240	226	1240	160	215	1300	<b>215</b>	<b>1300</b>	215	1300
531.deepsjeng_r	160	404	454	<b>404</b>	<b>454</b>	404	454	160	404	454	<b>404</b>	<b>454</b>	404	454
SPECrate®2017 int base		565												
SPECrate®2017 int peak		588												
Results appear in the order in which they were run. Bold underlined text indicates a median measurement.														

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
541.leela_r	160	596	444	595	446	<b>595</b>	<b>445</b>	160	596	444	595	446	<b>595</b>	<b>445</b>
548.exchange2_r	160	348	1210	348	1200	<b>348</b>	<b>1200</b>	160	348	1210	348	1200	<b>348</b>	<b>1200</b>
557.xz_r	160	<b>534</b>	<b>324</b>	534	324	535	323	160	<b>548</b>	<b>315</b>	543	318	549	315
SPECrate@2017 int base			565											
SPECrate@2017 int peak			588											
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"  
SCALING\_GOVERNOR set to Performance

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =
  "/home/CPU2017/lib/intel64:/home/CPU2017/lib/ia32:/home/CPU2017/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.:  
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.

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5,  
and the system compiler gcc 4.8.5;  
sources available from jemalloc.net or  
<https://github.com/jemalloc/jemalloc/releases>

## Platform Notes

BIOS configuration:  
ENERGY\_PERF\_BIAS\_CFG mode set to Performance  
Hardware Prefetch set to Disable  
VT Support set to Disable  
C1E Support set to Disable  
Sub NUMA Cluster (SNC) set to Enable  
Intel Hyper Threading Technology set to Enable

Sysinfo program /home/CPU2017/bin/sysinfo  
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c  
running on localhost.localdomain Thu Apr 22 23:53:16 2021

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 8380 CPU @ 2.30GHz
 2 "physical id"s (chips)
 160 "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 : 40
siblings : 80
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 32 33 34 35 36 37 38 39
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 32 33 34 35 36 37 38 39
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                160
On-line CPU(s) list:  0-159
Thread(s) per core:    2
Core(s) per socket:    40
Socket(s):             2
NUMA node(s):         4
Vendor ID:             GenuineIntel
CPU family:            6
Model:                106
Model name:            Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
Stepping:              6
CPU MHz:               3000.107
CPU max MHz:           3400.0000
CPU min MHz:           800.0000
BogoMIPS:              4600.00
Virtualization:       VT-x
L1d cache:            48K
L1i cache:            32K
L2 cache:             1280K
L3 cache:             61440K
NUMA node0 CPU(s):    0-19,80-99
NUMA node1 CPU(s):    20-39,100-119
NUMA node2 CPU(s):    40-59,120-139
NUMA node3 CPU(s):    60-79,140-159
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 noopl 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 invpcid_single ssbd mba ibrs
ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust
bmi1 hle avx2 smep bmi2 erms invpcid rtm 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 wbnoinvd
dtherm ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d
arch_capabilities
```

/proc/cpuinfo cache data  
cache size : 61440 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 16 17 18 19 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96 97 98 99
node 0 size: 257608 MB
node 0 free: 257150 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
node 1 size: 258039 MB
node 1 free: 257760 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
node 2 size: 258039 MB
node 2 free: 257740 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
```

```

143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
node 3 size: 258034 MB
node 3 free: 257771 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:      1056482912 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/sbin/tuned-adm active
It seems that tuned daemon is not running, preset profile is not activated.
Preset 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="8.2 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.2"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

```

```

uname -a:
Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
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/swaps
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): No status reported
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

```

```
run-level 3 Apr 22 23:50
```

```

SPEC is set to: /home/CPU2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   3.6T  225G  3.4T   7% /home

```

```

From /sys/devices/virtual/dmi/id
Vendor:          ProductMFR
Product:         NF5280M6
Product Family:  Family
Serial:          380251333

```

Additional information from dmidecode 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:
32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

```

```

BIOS:
  BIOS Vendor:      American Megatrends Inc.
  BIOS Version:     4.08.00
  BIOS Date:        04/16/2021
  BIOS Revision:    5.22

```

(End of data from sysinfo program)

### Compiler Version Notes

```

=====
C          | 500.perlbench_r(peak) 557.xz_r(peak)
-----

```

```

Intel(R) C 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.
-----

```

```

=====
C          | 502.gcc_r(peak)
-----

```

```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----

```

```

=====
C          | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
          | 525.x264_r(base, peak) 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          | 500.perlbench_r(peak) 557.xz_r(peak)
-----

```

```

Intel(R) C 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.
-----

```

```

=====
C          | 502.gcc_r(peak)
-----

```

```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----

```

```

=====
C          | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
          | 525.x264_r(base, peak) 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          | 500.perlbench_r(peak) 557.xz_r(peak)
-----

```

```

Intel(R) C 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.
-----

```

```

=====
C          | 502.gcc_r(peak)
-----

```

```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----

```

```

=====
C      | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
      | 525.x264_r(base, peak) 557.xz_r(base)
=====

```

```

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

```

```

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

```

```

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, peak)
=====

```

```

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
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

**Peak Compiler Invocation****C benchmarks (except as noted below):**

icx

500.perlbench\_r: icc

557.xz\_r: icc

**C++ benchmarks:**

icpx

**Fortran benchmarks:**

ifort

**Peak Portability Flags**

500.perlbench\_r: -DSPEC\_LP64 -DSPEC\_LINUX\_X64  
 502.gcc\_r: -D FILE OFFSET BITS=64  
 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

**Peak Optimization Flags****C benchmarks:**

500.perlbench\_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -ipo -O3  
-no-prec-div -qopt-mem-layout-trans=4 -fno-strict-overflow  
-mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64\_lin -lqkmalloc

502.gcc\_r: -m32 -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32\_lin -std=gnu89  
-Wl,-z,muldefs -fprofile-generate(pass 1) -fprofile-use=default.profddata(pass 2)  
-xCORE-AVX512 -flto -Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries -L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf\_r: basepeak = yes

525.x264\_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math  
-qopt-mem-layout-trans=4 -fno-alias -mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64\_lin -lqkmalloc

557.xz\_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -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:**

520.omnetpp\_r: basepeak = yes

523.xalancbmk\_r: basepeak = yes

531.deepsjeng\_r: basepeak = yes

541.leela\_r: basepeak = yes

**Fortran benchmarks:**

548.exchange2\_r: basepeak = yes

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/Inspur-Platform-Settings-V1.9.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/Inspur-Platform-Settings-V1.9.xml>.

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