## SPEC CPU®2017 Integer Rate Result

### Inspur Corporation

**Inspur NF5280M6 (Intel Xeon Silver 4314)**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3358</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Inspur Corporation</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Inspur Corporation</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Aug-2021</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>May-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

### Performance Results

```
<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<tbody>
<tr>
<td>perlbench_r</td>
<td>64</td>
<td>158</td>
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<tr>
<td>gcc_r</td>
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<tr>
<td>omnetpp_r</td>
<td>64</td>
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<tr>
<td>xalancbmk_r</td>
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<tr>
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<td>64</td>
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<td>deepsjeng_r</td>
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<td>leela_r</td>
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<tr>
<td>exchange2_r</td>
<td>64</td>
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<tr>
<td>xz_r</td>
<td>64</td>
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</tr>
</tbody>
</table>
```

### Hardware

- **CPU Name:** Intel Xeon Silver 4314
- **Max MHz:** 3400
- **Nominal:** 2400
- **Enabled:** 32 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:** 24 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R, running at 2666)
- **Storage:** 1 x 1.6 TB NVME SSD
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64
- **Compiler:** 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
- **Parallel:** No
- **Firmware:** Version 05.00.02 released May-2021
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Other:** Jemalloc memory allocator V5.0.1
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
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</tr>
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SPECrate®2017_int_base = 235
SPECrate®2017_int_peak = 243

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"
MALLOCS_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:

(Continued on next page)
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Inspur Corporation

Inspur NF5280M6 (Intel Xeon Silver 4314)  

SPECrate®2017_int_base = 235  
SPECrate®2017_int_peak = 243

CPU2017 License: 3358  
Test Sponsor: Inspur Corporation  
Tested by: Inspur Corporation

Test Date: Aug-2021  
Hardware Availability: May-2021  
Software Availability: Dec-2020

General Notes (Continued)

sync; echo 3>/proc/sys/vm/drop_caches  
runcpu command invoked through numaclt 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  

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

Sysinfo program /home/CPU2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d  
running on localhost.localdomain Thu Aug 26 07:27:25 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) Silver 4314 CPU @ 2.40GHz  
  2 "physical id"s (chips)  
  64 "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 : 16  
  siblings : 32  
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu from util-linux 2.32.1:

(Continued on next page)
Platform Notes (Continued)

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Silver 4314 CPU @ 2.40GHz
Stepping: 6
CPU MHz: 2900.000
CPU max MHz: 3400.0000
CPU min MHz: 800.0000
BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 24576K
NUMA node0 CPU(s): 0-7,32-39
NUMA node1 CPU(s): 8-15,40-47
NUMA node2 CPU(s): 16-23,48-55
NUMA node3 CPU(s): 24-31,56-63
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acp1 mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtrunc
lm constant_tsc arch_perfmon pebs bts rep_good nolocktpe nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
pcid dca sse4_1_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
rdandlahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd mba ibrs
 ibpb stibp ibrs_enhanced tpr_shadow vnni fexspriority ept vpid fsgsbase tsc_adjust
bmi1 bmi2 aarch64 amx smep erms invpcid rdtscpild tsc_apicinfo cpuid_multiple_errors
 invpd invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnni fexspriority
 ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtscpild tsc_apicinfo
 cpuid_multiple_errors
From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
Inspur Corporation  

Inspur NF5280M6 (Intel Xeon Silver 4314)  

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
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<tr>
<td>SPECrate®2017_int_peak</td>
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CPU2017 License: 3358  
Test Sponsor: Inspur Corporation  
Tested by: Inspur Corporation  

Test Date: Aug-2021  
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Platform Notes (Continued)

node 0 cpus: 0 1 2 3 4 5 6 7 32 33 34 35 36 37 38 39  
node 0 size: 257637 MB  
node 0 free: 257317 MB  
node 1 cpus: 8 9 10 11 12 13 14 15 40 41 42 43 44 45 46 47  
node 1 size: 258016 MB  
node 1 free: 257739 MB  
node 2 cpus: 16 17 18 19 20 21 22 23 48 49 50 51 52 53 54 55  
node 2 size: 258044 MB  
node 2 free: 257737 MB  
node 3 cpus: 24 25 26 27 28 29 30 31 56 57 58 59 60 61 62 63  
node 3 size: 258041 MB  
node 3 free: 257735 MB  
node distances:  
0: 10 11 20 20  
1: 11 10 20 20  
2: 20 20 10 11  
3: 20 20 11 10  

From /proc/meminfo
- MemTotal: 1056501424 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="8.2 (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

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

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**Platform Notes (Continued)**

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): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swaps barriers and __user pointer sanitization
- CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer sanitization
- CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
- CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Aug 26 07:26

SPEC is set to: /home/CPU2017

From /sys/devices/virtual/dmi/id

- Vendor: Inspur
- Product: NFS280M6
- Product Family: Family
- Serial: 221599009

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 SM BIOS" standard.

Memory:

- 32x Micron 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200, configured at 2666

BIOS:

- BIOS Vendor: American Megatrends Inc.
- BIOS Version: 05.00.02
- BIOS Date: 05/22/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)
Inspur Corporation

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**SPECrates**

- **2017_int_base** = 235
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**Compiler Version Notes**

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<tr>
<th>C</th>
<th>500.perlbench_r(peak) 557.xz_r(peak)</th>
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| 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. |

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| C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
|---------|--------------------------------------|
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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:**
- \(-w \-m64 \-Wl,\-z,muldefs \-xcORE-AVX512 \-O3 \-ipo \-no-prec-div\)
- \(-qopt-mem-layout-trans=4 \-nostandard-realloc-lhs \-align array32byte\)
- \(-auto \-mbranches\-within\-32B\-boundaries\)

(Continued on next page)
### Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- `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.ommnetpp_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`

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

### Inspur Corporation

**Inspur NF5280M6 (Intel Xeon Silver 4314)**

<table>
<thead>
<tr>
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<tr>
<td>Test Sponsor:</td>
<td>Inspur Corporation</td>
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<td>Tested by:</td>
<td>Inspur Corporation</td>
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<tr>
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<td>Aug-2021</td>
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<tr>
<td>Hardware Availability:</td>
<td>May-2021</td>
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<td>Software Availability:</td>
<td>Dec-2020</td>
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</table>

**SPECrate®2017_int_base = 235**

**SPECrate®2017_int_peak = 243**

### Peak Optimization Flags (Continued)

500.perlbench_r (continued):
- `-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(pass1)`
- `-fprofile-use=default.profdata(pass 2)` `-xCORE-AVX512` `-flto`
- `-Ofast(pass1)` `-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


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/Inspur-Platform-Settings-V2.1.xml
### SPEC CPU®2017 Integer Rate Result

**Inspur Corporation**  
**Inspur NF5280M6 (Intel Xeon Silver 4314)**

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- **CPU2017 License:** 3358  
- **Test Sponsor:** Inspur Corporation  
- **Tested by:** Inspur Corporation  
- **Test Date:** Aug-2021  
- **Hardware Availability:** May-2021  
- **Software Availability:** Dec-2020

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