## SPEC CPU®2017 Integer Rate Result

### Inspur Corporation

**Inspur NF5180M6 (Intel Xeon Silver 4310T)**

**SPECrates:**
- **SPECrates®2017_int_base** = 149
- **SPECrates®2017_int_peak** = 154

### Hardware

<table>
<thead>
<tr>
<th>Software</th>
<th>OS:</th>
<th>Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64</th>
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<td>Compiler:</td>
<td>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</td>
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<tr>
<td>Parallel:</td>
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<td>Firmware:</td>
<td>Version 05.00.02 released May-2021</td>
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<tr>
<td>File System:</td>
<td>xfs</td>
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<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
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<tr>
<td>Base Pointers:</td>
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<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
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<tr>
<td>Other:</td>
<td>jemalloc memory allocator V5.0.1</td>
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<tr>
<td>Power Management:</td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage.</td>
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**CPU2017 License:** 3358  
**Test Sponsor:** Inspur Corporation  
**Tested by:** Inspur Corporation

**Test Date:** Oct-2021  
**Hardware Availability:** May-2021  
**Software Availability:** Dec-2020

| Hardware | CPU2017 License: 3358  
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**Test Date:** Oct-2021  
**Hardware Availability:** May-2021  
**Software Availability:** Dec-2020

### Copies

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**SPECrate®2017_int_base** = 149  
**SPECrate®2017_int_peak** = 154

### CPU Name:

**Intel Xeon Silver 4310T**

**Max MHz:** 3400  
**Nominal:** 2300  
**Enabled:** 20 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:** 15 MB I+D on chip per core  
**Other:** None  
**Memory:** 1 TB (32 x 32 GB 2Rx8 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;
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- 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.
SPEC CPU®2017 Integer Rate Result

Inspur Corporation

Inspur NF5180M6 (Intel Xeon Silver 4310T)

SPEC CPU®2017_int_base = 149

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Results Table

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</table>

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 = 
  "/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 numaclt i.e.:

(Continued on next page)
Inspur Corporation
Inspur NF5180M6 (Intel Xeon Silver 4310T)

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

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.

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

Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6d
running on localhost.localdomain Thu Oct 21 11:31:21 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 4310T CPU @ 2.30GHz
           2 "physical id"s (chips)
           40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 5 6 7 8 9
physical 1: cores 0 1 2 3 4 5 6 7 8 9

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian

(Continued on next page)
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---

**Platform Notes (Continued)**

- CPU(s): 40
- On-line CPU(s) list: 0-39
- Thread(s) per core: 2
- Core(s) per socket: 10
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 106
- Model name: Intel(R) Xeon(R) Silver 4310T CPU @ 2.30GHz
- Stepping: 6
- CPU MHz: 2900.000
- 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: 15360K
- NUMA node0 CPU(s): 0-9, 20-29
- NUMA node1 CPU(s): 10-19, 30-39
- 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 aperfmperf pni pclmulqdq dtses64 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 ibrs Enhanced tpr_shadow vmx 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 xsavec qcm qcm_occp llc qcm_mbm_local qcm_mbm_global wbnoinvd dtherm ida arat pln pts avx512vbm umip pkp ospe avx512_vbmi2 gfni vaes vclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush l1d arch_capabilities

/proc/cpuinfo cache data  

```
cache size : 15360 KB
```

From numactl --hardware  

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

```
available: 2 nodes (0-1)  
nod 0 cpus: 0 1 2 3 4 5 6 7 8 9 20 21 22 23 24 25 26 27 28 29  
nod 0 size: 515684 MB  
nod 0 free: 515035 MB  
nod 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39  
nod 1 size: 516061 MB
```
## SPEC CPU® 2017 Integer Rate Result

**Inspur Corporation**

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<table>
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<tr>
<th>SPECrate® 2017_int_base = 149</th>
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<td>Hardware Availability: May-2021</td>
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</tr>
</tbody>
</table>

### Platform Notes (Continued)

```
node 1 free: 515609 MB
node distances:
    node  0  1
    0: 10 20
    1: 20 10

From /proc/meminfo
MemTotal: 1056507192 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

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

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

**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 Oct 21 11:30**

**SPEC is set to:** /home/CPU2017

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<tbody>
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<td>xfs</td>
<td>1.5T</td>
<td>112G</td>
<td>1.3T</td>
<td>8%</td>
<td>/home</td>
</tr>
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</table>

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

- **Vendor:** Inspur
- **Product:** NF5180M6
- **Product Family:** Family
- **Serial:** 380827124

**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)

---

**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**

(Continued on next page)
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**SPECrater®2017_int_base = 149**

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### Compiler Version Notes (Continued)

2021.1 Build 20201113
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<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113</td>
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<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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<tr>
<th>C</th>
<th>500.perlbench_r(peak) 557.xz_r(peak)</th>
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Inspur Corporation

Inspur NF5180M6 (Intel Xeon Silver 4310T)

**SPEC CPU®2017 Integer Rate Result**

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

**SPECrated®2017_int_base = 149**

**SPECrated®2017_int_peak = 154**

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**Compiler Version Notes (Continued)**

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<th>C</th>
<th>500.perlbench_r (base) 502.gcc_r (base) 505.mcf_r (base, peak) 525.x264_r (base, peak) 557.xz_r (base)</th>
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<th>520.omnetpp_r (base, peak) 523.xalancbmk_r (base, peak) 531.deepsjeng_r (base, peak) 541.leela_r (base, peak)</th>
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<th>Fortran</th>
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**Base Compiler Invocation**

**C benchmarks:**
- icx

**C++ benchmarks:**
- icpx

**Fortran benchmarks:**
- ifort
# SPEC CPU®2017 Integer Rate Result

## Inspec Corporation

**Inspec NF5180M6 (Intel Xeon Silver 4310T)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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**CPU2017 License:** 3358  
**Test Sponsor:** Inspec Corporation  
**Tested by:** Inspec Corporation  
**Test Date:** Oct-2021  
**Hardware Availability:** May-2021  
**Software Availability:** Dec-2020

### 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`

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(Continued on next page)
Inspur Corporation
Inspur NF5180M6 (Intel Xeon Silver 4310T)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 149
SPECrate®2017_int_peak = 154

Peak Compiler Invocation (Continued)

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-generatedebuginfo(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -fito
-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

(Continued on next page)
Inspur Corporation
Inspur NF5180M6 (Intel Xeon Silver 4310T)

SPECrate®2017_int_base = 149
SPECrate®2017_int_peak = 154

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### CPU Load

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### Fortran Load

<table>
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<tr>
<td>548.exchange2_r</td>
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### Peak Optimization Flags (Continued)


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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

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