### Inspur Corporation

**Inspur NS5486M6 (Intel Xeon Silver 4314)**

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
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<tbody>
<tr>
<td>244</td>
<td>249</td>
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</table>

**CPU2017 License:** 3358

**Test Sponsor:** Inspur Corporation

**Test Date:** Sep-2021

**Tested by:** Inspur Corporation

**Hardware Availability:** May-2021

**Software Availability:** Dec-2020

---

#### Software

- **OS:** Red Hat Enterprise Linux release 8.2 (Ootpa)
  4.18.0-193.el8.x86_64
- **Compiler:**
  - 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 05.01.00 released Jun-2021
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.

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#### Hardware

<table>
<thead>
<tr>
<th>Hardware</th>
<th>SPECrate®2017_fp_base (244)</th>
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<td>519.lbm_r</td>
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<tr>
<td>521.wrf_r</td>
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<tr>
<td>554.roms_r</td>
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</table>

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#### 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:

- 512 GB (16 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)

#### Storage:

- 1 x 1 TB SATA SSD

#### Other:

- None
## SPEC CPU®2017 Floating Point Rate Result

### Inspur Corporation

**Inspur NS5486M6 (Intel Xeon Silver 4314)**

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

### Results Table

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</table>

**SPECrate®2017_fp_base = 244**  
**SPECrate®2017_fp_peak = 249**

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/je5.0.1-64"  
MALLOCONF = "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

(Continued on next page)
Insipur Corporation

Inspur NS5486M6 (Intel Xeon Silver 4314)

SPECrate®2017_fp_base = 244
SPECrate®2017_fp_peak = 249

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

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

General Notes (Continued)

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.


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 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Wed Sep 29 13:05:22 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)
SPEC CPU®2017 Floating Point Rate Result

Inspur Corporation

Inspur NS5486M6 (Intel Xeon Silver 4314)

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

SPECrates®2017_fp_base = 244
SPECrates®2017_fp_peak = 249

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

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: 2899.782
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 acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                  lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
                  aperfmerf pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
                  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 3nowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd mba ibrs
                  ibpb stibp ibrs_enhanced tpr_shadow vnumi flexpriority ept vpid fsgsbase tsc_adjust
                  bmi1 hle avx2 smep bmi2 ertms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                  avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt
                  xsavec xgetbv1 xsavec cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local wbnoiwvd
                  dtherm ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfnl vaes vpclmulqdq
                  avx512_vnni avx512_bitalg tme avx512_vpopcntdq lal57 rdpid md_clear pconfig flush_l1d
                  arch_capabilities

/proc/cpuinfo cache data
cache size : 24576 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)

(Continued on next page)
Inspur Corporation

Inspur NS5486M6 (Intel Xeon Silver 4314)

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

SPECrate\textsuperscript{\textregistered}2017\_fp\_peak = 249
SPECrate\textsuperscript{\textregistered}2017\_fp\_base = 244

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: 128586 MB
node 0 free: 117712 MB
node 1 cpus: 8 9 10 11 12 13 14 15 40 41 42 43 44 45 46 47
node 1 size: 129020 MB
node 1 free: 122543 MB
node 2 cpus: 16 17 18 19 20 21 22 23 48 49 50 51 52 53 54 55
node 2 size: 129020 MB
node 2 free: 122351 MB
node 3 cpus: 24 25 26 27 28 29 30 31 56 57 58 59 60 61 62 63
node 3 size: 129017 MB
node 3 free: 122543 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: 528020336 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)
Inspur Corporation

Inspur NS5486M6 (Intel Xeon Silver 4314)

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

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

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/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
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 Sep 29 05:25

SPEC is set to: /home/CPU2017

Memory:
16x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2666

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 05.01.00
BIOS Date: 06/18/2021
BIOS Revision: 5.22

(End of data from sysinfo program)
## SPEC CPU®2017 Floating Point Rate Result

### Inspur Corporation

**Inspur NS5486M6 (Intel Xeon Silver 4314)**

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### Compiler Version Notes

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**Inspur Corporation**

**Inspur NS5486M6 (Intel Xeon Silver 4314)**

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<th>SPECrate®2017_fp_base = 244</th>
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CPU2017 License: 3358  
Test Sponsor: Inspur Corporation  
Tested by: Inspur Corporation

**Compiler Version Notes (Continued)**

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**C++, C**  
511.povray_r(base) 526.blender_r(base, peak)

Intel (R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
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**C++, C, Fortran**  
507.cactuBSSN_r(base, peak)

Intel (R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
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**Fortran**  
503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

Intel (R) Fortran Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.1 Build 20201112_000000  
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**Fortran, C**  
521.wrf_r(peak)

Intel (R) Fortran Intel(R) 64 Compiler Classic for applications running on  
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(Continued on next page)
Compiler Version Notes (Continued)

Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)

==============================================================================
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Fortran, C | 521.wrf_r(peak)

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Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)

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Base Compiler Invocation

C benchmarks:
- icx

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

(Continued on next page)
Insper Corporation
Insper NS5486M6 (Intel Xeon Silver 4314)

SPECrater®2017_fp_base = 244
SPECrater®2017_fp_peak = 249

**CPU2017 License:** 3358  
**Test Sponsor:** Insper Corporation

**Tested by:** Insper Corporation  
**Hardware Availability:** May-2021

**Test Date:** Sep-2021  
**Software Availability:** Dec-2020

Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=cl1 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only

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Inspur Corporation
Inspur NS5486M6 (Intel Xeon Silver 4314)

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-qpopt-multiple-gather-scatter-by-shuffles -qpopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
-w -m64 -std=c11 -Wl,-z,xmuldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qpopt-mem-layout-trans=4 -O3 -ipo
-no-prec-div -qpopt-prefetch -ffinite-math-only
-qpopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z,xmuldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qpopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
-w -m64 -std=c11 -Wl,-z,xmuldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qpopt-mem-layout-trans=4 -O3
-no-prec-div -qpopt-prefetch -ffinite-math-only
-qpopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
521.wrf_r:ifort icx

(Continued on next page)
Peak Compiler Invocation (Continued)

527.cam4_r: ifort icx

Benchmarks using both C and C++:
511.povray_r: icpc icc
526.blender_r: icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes
544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -qopt-mem-layout-trans=4
-fimf-accuracy-bits=14:sqrt
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
503.bwaves_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -ipo
-no-prec-div -qopt-prefetch -ffinite-math-only

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Peake Optimization Flags (Continued)

503.bwaves_r (continued):
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

549.fotonik3d_r: basepeak = yes

554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_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
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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 2021-09-29 13:05:22-0400.

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