## SPEC CPU®2017 Floating Point Rate Result

### Inspur Corporation

**Inspur NF5180M6 (Intel Xeon Gold 6346)**

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Inspur Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Inspur Corporation</td>
</tr>
<tr>
<td>CPU2017 License:</td>
<td>3358</td>
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<td>Test Date:</td>
<td>Jun-2021</td>
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<tr>
<td>Hardware Availability:</td>
<td>May-2021</td>
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<tr>
<td>Software Availability:</td>
<td>Jan-2021</td>
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### SPECrate®2017_fp_base = 313

### SPECrate®2017_fp_peak = 319

#### Hardware

<table>
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<td>507.cactuBSSN_r</td>
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<td>508.namd_r</td>
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<td>519.lbm_r</td>
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<td>521.wrf_r</td>
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<td>526.blender_r</td>
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<td>527.cam4_r</td>
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<tr>
<td>554.roms_r</td>
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#### 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 5.00.00 released Apr-2021
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 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.

#### CPU Name:
- **Intel Xeon Gold 6346**

#### Max MHz:
- **3600**

#### Nominal:
- **3100**

#### 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:
- **36 MB I+D on chip per chip**

#### Other:
- **None**

#### Memory:
- **512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)**

#### Storage:
- **1 x 4 TB NVME SSD**

#### Other:
- **None**
Inspir Corporation

Inspir NF5180M6 (Intel Xeon Gold 6346)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECCPU®2017_fp_base = 313
SPECCPU®2017_fp_peak = 319

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

Test Date: Jun-2021
Hardware Availability: May-2021
Software Availability: Jan-2021

Results Table

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<td>321</td>
<td>158</td>
</tr>
</tbody>
</table>

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"
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

(Continued on next page)
General Notes (Continued)

Filesystem page cache synced and cleared with:
  sync; echo 3>/proc/sys/vm/drop_caches
runruncpu command invoked through numactl i.e.:
  numactl --interleave=all runruncpu <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
  Sub NUMA Cluster (SNC) set to Enable
  Intel Hyper Threading Technology set to Enable

Sysinfo program /home/CPU2017/bin/sysinfo
  Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca664d
  running on localhost.localdomain Thu Jun 17 15:09:34 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) Gold 6346 CPU @ 3.10GHz
      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

(Continued on next page)
Inspur Corporation

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**CPU2017 License:** 3358

**Test Sponsor:** Inspur Corporation

**Test Date:** Jun-2021

**Tested by:** Inspur Corporation

**Hardware Availability:** May-2021

**Software Availability:** Jan-2021

### Platform Notes (Continued)

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):              64
On-line CPU(s) list: 0-63
Thread(s) per core:  2
Core(s) per socket:  16
Socket(s):           2
NUMA node(s):        2
Vendor ID:           GenuineIntel
CPU family:          6
Model:               106
Model name:          Intel(R) Xeon(R) Gold 6346 CPU @ 3.10GHz
Stepping:            6
CPU MHz:             3600.413
CPU max MHz:         3600.0000
CPU min MHz:         800.0000
BogoMIPS:            6200.00
Virtualization:      VT-x
L1d cache:           48K
L1i cache:           32K
L2 cache:            1280K
L3 cache:            36864K
NUMA node0 CPU(s):   0-15,32-47
NUMA nodel CPU(s):   16-31,48-63
Flags:               fpu vme de pse pmr mcm osa cmx stp mmm redZX abm pat cmx8pat cmx16 cmx32 cmx512
                      mm nonstop_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc md cpx sse4_1 sse4_2 sse2 ss ht tm pbe syscall nx pdpe1gb rs pou rdpgc vs 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 vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invvpclmtd rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512fma clflushopt clwb intel_pt avx512cd sha_xni avx512bw avx512vl xsaveopt xsaves xsavec qxtbv1 xsavec xmm_cmm xsave cmx_occup_llc cmx_mbb_total cmx_mbb_local wbnoinvd dtmdev ida atin lnln pts avx512vbmi umip pkp oske avx512vbmi2 gfnv vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities
```

From `numactl --hardware`

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

**Available:** 2 nodes (0-1)
Inspur Corporation

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Platform Notes (Continued)

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 0 size: 257635 MB
node 0 free: 241321 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
node 1 size: 258010 MB
node 1 free: 244167 MB
node distances:
node 0 1
0: 10 20
1: 20 10

From /proc/meminfo
MemTotal: 528022316 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*

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

(Continued on next page)
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Platform Notes (Continued)

Microarchitectural Data Sampling:
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass):

CVE-2017-5753 (Spectre variant 1): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5715 (Spectre variant 2): Mitigation: usercopy/swapps 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 Jun 17 08:59

SPEC is set to: /home/CPU2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 3.6T 74G 3.6T 3% /home

From /sys/devices/virtual/dmi/id
Vendor: MFR
Product: NF5180M6
Product Family: Family
Serial: 380827124

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:
16x NO DIMM NO DIMM
16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 05.00.00
BIOS Date: 04/25/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
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Compiler Version Notes (Continued)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
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==============================================================================
C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)
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==============================================================================
C++, C          | 511.povray_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.
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icx

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Inspur Corporation

Inspur NF5180M6 (Intel Xeon Gold 6346)

**SPECrate®2017_fp_base = 313**

**SPECrate®2017_fp_peak = 319**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3358</th>
</tr>
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<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>Jun-2021</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>May-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jan-2021</td>
</tr>
</tbody>
</table>

Base Compiler Invocation (Continued)

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=c11 -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
-qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -ljemalloc
```

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

Fortran benchmarks (continued):
- `L/usr/local/jemalloc64-5.0.1/lib`

Benchmarks using both Fortran and C:
- `-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math`
- `-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo`
- `-no-prec-div -qopt-prefetch -ffinite-math-only`
- `-qopt-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,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`

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

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**Peak Compiler Invocation**

C benchmarks:
- `icx`

C++ benchmarks:
- `icpx`

Fortran benchmarks:
- `ifort`

Benchmarks using both Fortran and C:
- `521.wrf_r: ifort icc`
- `527.cam4_r: ifort icx`

Benchmarks using both C and C++:

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## SPEC CPU®2017 Floating Point Rate Result

**Inspur Corporation**

**Inspur NF5180M6 (Intel Xeon Gold 6346)**

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<tr>
<th>SPECrate®2017_fp_base</th>
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**CPU2017 License**: 3358

**Test Sponsor**: Inspur Corporation

**Tested by**: Inspur Corporation

**Test Date**: Jun-2021

**Hardware Availability**: May-2021

**Software Availability**: Jan-2021

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### Peak Compiler Invocation (Continued)

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<tr>
<td>511.povray_r</td>
<td>icpc icc</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>icpx icx</td>
</tr>
</tbody>
</table>

Benchmarks using Fortran, C, and C++:

- icpx icx ifort

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### Peak Portability Flags

Same as Base Portability Flags

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### Peak Optimization Flags

**C benchmarks**:

- 519.lbm_r: basepeak = yes
- 538.imagick_r: basepeak = yes

**C++ benchmarks**:

- 508.namd_r: basepeak = yes

**Fortran benchmarks**:


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Inspur Corporation

Inspur NF5180M6 (Intel Xeon Gold 6346)

SPEC CPU®2017 Floating Point Rate Result

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CPU2017 License: 3358
Test Sponsor: Inspur Corporation
Test Date: Jun-2021
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Peak Optimization Flags (Continued)

549.fotonik3d_r: basepeak = yes
554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:


527.cam4_r: basepeak = yes

Benchmarks using both C and C++:


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
http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-V2.0.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/Inspur-Platform-Settings-V2.0.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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