## SPEC CPU®2017 Floating Point Rate Result

### Inspur Corporation

**Inspur NF5280M5 (Intel Xeon Gold 6258R)**

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**Hardware**

- **CPU Name:** Intel Xeon Gold 6258R
- **Max MHz:** 4000
- **Nominal:** 2700
- **Enabled:** 56 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 38.5 MB I+D on chip per chip
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 2 TB NVME SSD
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux release 8.1 (Ootpa) 4.18.0-147.el8.x86_64
- **Compiler:** C/C++; Version 19.1.1.217 of Intel C/C++ Compiler Build 20200306 for Linux;
  Fortran: Version 19.1.1.217 of Intel Fortran Compiler Build 20200306 for Linux
- **Parallel:** No
- **Firmware:** Version 4.1.7 released Apr-2019
- **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.
# SPEC CPU®2017 Floating Point Rate Result

## Inspur Corporation

**Inspur NF5280M5 (Intel Xeon Gold 6258R)**

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## Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux. The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux.

## 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"
```
## SPEC CPU®2017 Floating Point Rate Result

### Insapur Corporation

**Inspur NF5280M5 (Intel Xeon Gold 6258R)**

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 300</th>
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<tr>
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<td><strong>Test Date:</strong> Jul-2020</td>
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<tr>
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<td><strong>Hardware Availability:</strong> Feb-2020</td>
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<tr>
<td><strong>Tested by:</strong> Insapur Corporation</td>
<td><strong>Software Availability:</strong> Apr-2020</td>
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</table>

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0

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


### 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
- IMC (Integrated memory controller) Interleaving set to 1-way
- Sub NUMA Cluster (SNC) set to Enable

Sysinfo program /home/CPU2017/bin/sysinfo

Rev: r6365 of 2019-08-21 295195f88a3d7ed6b1e6e46a485a0011

running on localhost.localdomain Thu Jul 2 10:02:00 2020

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 6258R CPU @ 2.70GHz
2 "physical id"s (chips)
112 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
```

(Continued on next page)
Inspur Corporation

Inspur NF5280M5 (Intel Xeon Gold 6258R)

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

SPEC CPU®2017 Floating Point Rate Result

SPECrate®2017_fp_base = 300
SPECrate®2017_fp_peak = 319

Test Date: Jul-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Platform Notes (Continued)

cpu cores : 28
siblings : 56
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 112

On-line CPU(s) list: 0-111
Thread(s) per core: 2
Core(s) per socket: 28
Socket(s): 2
NUMA node(s): 4

Vendor ID: GenuineIntel
CPU family: 6
Stepping: 7
CPU MHz: 3399.976
CPU max MHz: 4000.000
CPU min MHz: 1000.000

BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 3942K

NUMA node0 CPU(s): 0-3,7-9,14-17,21-23,56-59,63-65,70-73,77-79
NUMA node1 CPU(s): 4-6,10-13,18-20,24-27,60-62,66-69,74-76,80-83
NUMA node2 CPU(s): 28-31,35-37,42-45,49-51,84-87,91-93,98-101,105-107
NUMA node3 CPU(s): 32-34,38-41,46-48,52-55,88-90,94-97,102-104,108-111

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 nonstop_tsc cpuid aperfmperf 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 cdp_l3 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpd fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rd t_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaveprec xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pfn pts ksu ospke avx512_vnni md_clear flush_l1d arch_capabilities

(Continued on next page)
Inspur Corporation
Inspur NF5280M5 (Intel Xeon Gold 6258R)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

Inspur Corporation
Inspur NF5280M5 (Intel Xeon Gold 6258R)

SPECrate®2017_fp_base = 300
SPECrate®2017_fp_peak = 319

CPU2017 License: 3358
Test Sponsor: Inspur Corporation
Test Date: Jul-2020
Hardware Availability: Feb-2020
Tested by: Inspur Corporation
Tested by: Inspur Corporation
Software Availability: Apr-2020

Platform Notes (Continued)

/proc/cpuinfo cache data
 cache size : 39424 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 7 8 9 14 15 16 17 21 22 23 56 57 58 59 63 64 65 70 71 72 73 77 78
 node 0 size: 192101 MB
 node 0 free: 178268 MB
 node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 60 61 62 66 67 68 69 74 75 76 80 81
 node 1 size: 193504 MB
 node 1 free: 181997 MB
 node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 84 85 86 87 91 92 93 98 99 100
 node 2 size: 193530 MB
 node 2 free: 182225 MB
 node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 88 89 90 94 95 96 97 102 103 104
 node 3 size: 193529 MB
 node 3 free: 182192 MB
 node distances:
 node 0 1 2 3
 0:  10  11  21  21
 1:  11  10  21  21
 2:  21  21  10  11
 3:  21  21  11  10

From /proc/meminfo
 MemTotal:       791210944 kB
 HugePages_Total:       0
 Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
o s-release:
 NAME="Red Hat Enterprise Linux"
 VERSION="8.1 (Ootpa)"
 ID="rhel"
 ID_LIKE="fedora"
 VERSION_ID="8.1"
 PLATFORM_ID="platform:el8"
 PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
 ANSI_COLOR="0;31"
 redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
 system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
 system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Inspur Corporation
Inspur NF5280M5 (Intel Xeon Gold 6258R)

SPEC®2017_fp_base = 300
SPEC®2017_fp_peak = 319

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

Test Date: Jul-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Platform Notes (Continued)

uname -a:
Linux localhost.localdomain 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
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/swapsgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Jul 2 00:18

SPEC is set to: /home/CPU2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 1.8T 82G 1.7T 5% /home

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 4.1.7 04/19/2019
Vendor: Inspur
Product: NF5180M5
Serial: 219243921

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:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 519.1bm_r(base, peak) 538.imagick_r(base, peak)
| 544.nab_r(base, peak)

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304

(Continued on next page)
**Compiler Version Notes (Continued)**

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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Inspur Corporation

Inspur NF5280M5 (Intel Xeon Gold 6258R)

SPECrates

- SPECerate\textsuperscript{\textregistered}2017\_fp\_base = 300
- SPECerate\textsuperscript{\textregistered}2017\_fp\_peak = 319

**CPU2017 License:** 3358
**Test Sponsor:** Inspur Corporation
**Test Date:** Jul-2020
**Hardware Availability:** Feb-2020
**Tested by:** Inspur Corporation
**Software Availability:** Apr-2020

**Compiler Version Notes (Continued)**

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C++, C, Fortran | 507.cactuBSSN_r(base, peak)
```

```
C++, C, Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
```

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

(Continued on next page)
Inspur Corporation

Inspur NF5280M5 (Intel Xeon Gold 6258R)

SPECrater®2017_fp_base = 300

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

Test Date: Jul-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Compiler Version Notes (Continued)

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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Fortran, C      | 521.wrf_r(base) 527.cam4_r(base, peak)
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
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==============================================================================

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

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Inspur Corporation

Inspur NF5280M5 (Intel Xeon Gold 6258R)

SPECrates®2017_fp_base = 300

SPECrates®2017_fp_peak = 319

CPU2017 License: 3358
Test Sponsor: Inspur Corporation
Test Date: Jul-2020
Hardware Availability: Feb-2020
Tested by: Inspur Corporation
Tested by: Inspur Corporation
Software Availability: Apr-2020

Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

icpc icc 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.ibm_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:
-m64 -qnextgen -std=c11
-W1,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -qnextgen -W1,-plugin-opt=-x86-branches-within-32B-boundaries
-W1,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -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
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-m64 -gnextgen -std=c11
-Will -plugin-opt=-x86-branches-within-32B-boundaries -Will,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -03 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both C and C++:
-m64 -gnextgen -std=c11
-Will -plugin-opt=-x86-branches-within-32B-boundaries -Will,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -gnextgen -std=c11
-Will -plugin-opt=-x86-branches-within-32B-boundaries -Will,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -03 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

(Continued on next page)
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Software Availability: Apr-2020

Peak Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
icpc icc 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: basepeak = yes

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r -m64 -qnextgen
-Wl, -plugin-opt=--x86-branches-within-32B-boundaries
-Wl, -z, muldefs -fuse-ld=gold -xCORE-AVX512 -O3 -ffast-math -ftol -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

Fortran benchmarks:
503.bwaves_r -m64 -Wl, -plugin-opt=--x86-branches-within-32B-boundaries
-Wl, -z, muldefs -fuse-ld=gold -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
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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

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## SPEC CPU®2017 Floating Point Rate Result

**Inspur Corporation**

Inspur NF5280M5 (Intel Xeon Gold 6258R)

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<th>CPU2017 License</th>
<th>Test Sponsor</th>
<th>Tested by</th>
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<th>Test Date</th>
<th>Hardware Availability</th>
<th>SPECrate®2017_fp_peak</th>
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<td>Jul-2020</td>
<td>Feb-2020</td>
<td>319</td>
<td>Apr-2020</td>
</tr>
</tbody>
</table>

### Peak Optimization Flags (Continued)

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-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-V1.9.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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