# SPEC CPU®2017 Integer Rate Result

## Inspur Corporation

### Inspur NF5280M6 (Intel Xeon Platinum 8380)

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Apr-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Feb-2021</td>
</tr>
</tbody>
</table>

### CPU2017 License: 3358

### Test Sponsor: Inspur Corporation

### Tested by: Inspur Corporation

### SPECrate®2017_int_base = 565

### SPECrate®2017_int_peak = 588

## Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Platinum 8380</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz:</td>
<td>3400</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2300</td>
</tr>
<tr>
<td>Enabled:</td>
<td>80 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>60 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 4 TB NVME SSD</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

## 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

### Firmware: Version 4.08.00 released Apr-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.

## SPECrate®2017_int_base = 565

[Graph of SPECrate®2017_int_base vs. SPECrate®2017_int_peak]

### SPECrate®2017_int_peak = 588

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (565)</th>
<th>SPECrate®2017_int_peak (588)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1200</td>
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<tr>
<td>100</td>
<td>1240</td>
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<td>1500</td>
<td>1950</td>
</tr>
<tr>
<td>1600</td>
<td>2000</td>
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</tbody>
</table>

### Benchmarks

- 500.perlbench_r: 160 copies, SPECRate®2017_int_base = 406, SPECRate®2017_int_peak = 476
- 502.gcc_r: 160 copies, SPECRate®2017_int_base = 414, SPECRate®2017_int_peak = 476
- 505.mcf_r: 160 copies, SPECRate®2017_int_base = 515, SPECRate®2017_int_peak = 588
- 520.omnetpp_r: 160 copies, SPECRate®2017_int_base = 312
- 523.xalancbmk_r: 160 copies, SPECRate®2017_int_base = 716
- 525.x264_r: 160 copies, SPECRate®2017_int_base = 716
- 531.deepsjeng_r: 160 copies, SPECRate®2017_int_base = 454
- 541.leela_r: 160 copies, SPECRate®2017_int_base = 445
- 548.exchange2_r: 160 copies, SPECRate®2017_int_base = 324
- 557.xz_r: 160 copies, SPECRate®2017_int_base = 315
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>627</td>
<td>406</td>
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<td>548</td>
<td>315</td>
<td>543</td>
<td>318</td>
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</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/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
```

(Continued on next page)
SPEC CPU®2017 Integer Rate Result
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Inspur Corporation
Inspur NF5280M6 (Intel Xeon Platinum 8380)

SPECrater®2017_int_base = 565
SPECrater®2017_int_peak = 588

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

General Notes (Continued)

runccpu command invoked through numactl i.e.:
numactl --interleave=all runccpu <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: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Thu Apr 22 23:53:16 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) Platinum 8380 CPU @ 2.30GHz
  2 "physical id"s (chips)
  160 "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 : 40
siblings : 80
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
  8
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
(Continued on next page)
Platform Notes (Continued)

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 160
- On-line CPU(s) list: 0-159
- Thread(s) per core: 2
- Core(s) per socket: 40
- Socket(s): 2
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 106
- Model name: Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
- Stepping: 6
- CPU MHz: 3000.107
- 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: 61440K
- NUMA node0 CPU(s): 0-19, 80-99
- NUMA node1 CPU(s): 20-39, 100-119
- NUMA node2 CPU(s): 40-59, 120-139
- NUMA node3 CPU(s): 60-79, 140-159
- 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 rdtsscp
  lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
  aperfmpref 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 ebpx cat ls invpcid_single ssbd mba ibrs
  ibpb stibp ibrs_enhanced tpr_shadow vsni fpxtrality ept vpid fsgsbase ts_cadjust
  bmi1 hle avx2 smep bmi2 erms invpcid rtm cmn rdt_a avx512f avx512dq rdseed adx smap
  avx512ifm a cflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt
  xsave xsvtreeview xsaveas cmm_glass cmm_occip_11c cmm_memb_total cmm_memb_local wbnoinvd
  dtherm ida arat pln pts avx512vbm m a vpu oske avx512_vbm gfni vae vpclmulqd q
  avx512_vnni avx512 bitalg tme avx512 vpopcntdq la57 rdpid md_clear pconfig flush_lid
  arch_capabilities

/proc/cpuinfo cache data
- cache size: 6140 KB

From numact1 --hardware WARNING: a numactl 'node' might or might not correspond to a
Inspur Corporation

Inspur NF5280M6 (Intel Xeon Platinum 8380)

SPECrate®2017_int_base = 565
SPECrate®2017_int_peak = 588

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

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021

Platform Notes (Continued)

physical chip.

available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96 97 98 99
node 0 size: 257608 MB
node 0 free: 257150 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
node 1 size: 258039 MB
node 1 free: 257760 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
node 2 size: 258039 MB
node 2 free: 257740 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
node 3 size: 258034 MB
node 3 free: 257771 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: 1056482912 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*
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"

(Continued on next page)
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Platform Notes (Continued)

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/swapgs barriers and __user pointer
sanitization
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 Apr 22 23:50

SPEC is set to: /home/CPU2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 3.6T 225G 3.4T 7% /home

From /sys/devices/virtual/dmi/id
Vendor: ProductMFR
Product: NF5280M6
Product Family: Family
Serial: 380251333

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:
32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 4.08.00

(Continued on next page)
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Platform Notes (Continued)

BIOS Date: 04/16/2021
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 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base)
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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C | 502.gcc_r(peak)
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Compiler Version Notes (Continued)

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base)
--- Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
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---
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
  2021.1 Build 20201113
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---
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base)
--- Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
---
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
| 531.deepsjeng_r(base, peak) 541.leela_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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Fortran | 548.exchange2_r(base, peak)
(Continued on next page)
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Tested by: Inspur Corporation

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Compiler Version Notes (Continued)

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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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

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**SPEC CPU®2017 Integer Rate Result**

**Inspur Corporation**

**Inspur NF5280M6 (Intel Xeon Platinum 8380)**

| SPECrate®2017_int_base = 565 | SPECrate®2017_int_peak = 588 |

- **CPU2017 License:** 3358
- **Test Sponsor:** Inspur Corporation
- **Tested by:** Inspur Corporation
- **Test Date:** Apr-2021
- **Hardware Availability:** Apr-2021
- **Software Availability:** Feb-2021

### Base Optimization Flags (Continued)

C++ benchmarks (continued):
- `-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`
  - 557.xz_r: `icc`

**C++ benchmarks:**

- `icpx`

**Fortran benchmarks:**

- `ifort`

### Peak Portability Flags

- 500.perlbench_r: `-DSPEC_LP64`
- 502.gcc_r: `-D_FILE_OFFSET_BITS=64`
- 505.mcf_r: `-DSPEC_LP64`
- 520.omnetpp_r: `-DSPEC_LP64`
- 523.xalancbmk_r: `-DSPEC_LP64`
- 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`
## SPEC CPU®2017 Integer Rate Result

**Inspur Corporation**

Inspur NF5280M6 (Intel Xeon Platinum 8380)

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<th>SPECrate®2017_int_base</th>
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### Peak Optimization Flags

**C benchmarks:**

500.perlbench_r: -Wl, -z, multidefs -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=gnu99 -Wl, -z, multidefs -fprofile-generate(pass 1)  
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto  
-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

525.x264_r: -w -std=c11 -m64 -Wl, -z, multidefs -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

### 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
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### Inspur Corporation

**Insper NF5280M6 (Intel Xeon Platinum 8380)**

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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-V1.9.xml

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