Inspur Corporation

Inspur NF5180M5 (Intel Xeon Gold 6248R)

SPECrate®2017_int_base = 338
SPECrate®2017_int_peak = 350

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

500.perlbench_r  96
  240

502.gcc_r  96
  240

505.mcf_r  96
  256

520.omnetpp_r  96
  186

523.xalancbmk_r  96
  446

525.x264_r  96
  716

531.deepsjeng_r  96
  446

541.leela_r  96
  738

548.exchange2_r  96
  686

557.xz_r  96
  738

**Software**

OS: Red Hat Enterprise Linux release 8.0 (Ootpa) 4.18.0-80.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 4.1.5 released May-2019
File System: xfs
System State: Run level 5 (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 NF5180M5 (Intel Xeon Gold 6248R)

---

**SPECrate®2017 int_base = 338**

**SPECrate®2017 int_peak = 350**

---

**Results Table**

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<th>Benchmark</th>
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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/lib/ia32:/home/CPU2017/je5.0.1-32"
MALLOCONF = "retain:true"
```
**SPEC CPU®2017 Integer Rate Result**

**Inspur Corporation**

Inspur NF5180M5 (Intel Xeon Gold 6248R)

<table>
<thead>
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<th>SPECrate®2017_int_base = 338</th>
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**CPU2017 License:** 3358  
**Test Sponsor:** Inspur Corporation  
**Tested by:** Inspur Corporation

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<th>Test Date: Jul-2020</th>
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<tr>
<td>Software Availability: Apr-2020</td>
<td></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.:  
umactl --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 295195f808a3d7ed1e6e46a465a0111  
running on localhost.localdomain Fri Jun 22 07:19:19 2018

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 6248R CPU @ 3.00GHz  
  2 "physical id"s (chips)  
  96 "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)
Platform Notes (Continued)

cpu cores : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu:
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
CPU(s):              96
On-line CPU(s) list: 0-95
Thread(s) per core:  2
Core(s) per socket:  24
Socket(s):           2
NUMA node(s):        4
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Gold 6248R CPU @ 3.00GHz
Stepping:            7
CPU MHz:             3600.035
CPU max MHz:         4000.0000
CPU min MHz:         1200.0000
BogoMIPS:            6000.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            36608K
NUMA node0 CPU(s):   0-3,7-9,13-15,19,20,48-51,55-57,61-63,67,68
NUMA node1 CPU(s):   4-6,10-12,16-18,21-23,52-54,58-60,64-66,69-71
NUMA node2 CPU(s):   24-27,31-33,37-39,43,44,72-75,79-81,85-87,91,92
NUMA node3 CPU(s):   28-30,34-36,40-42,45-47,76-78,82-84,88-90,93-95
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 pdelgb rdtscp
lm constant_tsc arch_perfmon pbez bts rep_good nobl xtopology nonstop_tsc cpuid
aperfmperf pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpdr
cdm cdic sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single
intel_ppin ssbd mba ibrs ibp bsb ibrs_enhanced tpr_shadow vmi flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invvpid cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsavesopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data
cache size : 36608 KB

(Continued on next page)
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 13 14 15 19 20 48 49 50 51 55 56 57 61 62 63 67 68
node 0 size: 191846 MB
node 0 free: 191437 MB
node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 52 53 54 58 59 60 64 65 66 69 70 71
node 1 size: 193531 MB
node 1 free: 193241 MB
node 2 cpus: 24 25 26 27 31 32 33 37 38 39 43 44 72 73 74 75 79 80 81 85 86 87 91 92
node 2 size: 193506 MB
node 2 free: 193240 MB
node 3 cpus: 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 89 90 93 94 95
node 3 size: 193530 MB
node 3 free: 193236 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:       790952752 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.0 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.0"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"
    ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga

  uname -a:
  Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
Platform Notes (Continued)

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 5 Jun 22 07:11
SPEC is set to: /home/CPU2017
Filesystem  Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   1.8T   87G  1.7T   5% /home

From /sys/devices/virtual/dmi/id
BIOS:    American Megatrends Inc. 4.1.5 05/21/2019
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 Hynix HMAA4GR7AJR8N-WM 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

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<table>
<thead>
<tr>
<th>C</th>
<th>502.gcc_r(peak)</th>
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<tbody>
<tr>
<td>Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304</td>
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<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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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) C Compiler for applications running on Intel(R) 64, Version 2021.1 |

(Continued on next page)
Insipur Corporation

Inspur NF5180M5 (Intel Xeon Gold 6248R)

SPEC CPU®2017 Integer Rate Result

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Copyright 2017-2020 Standard Performance Evaluation Corporation

Inspur Corporation

Inspur NF5180M5 (Intel Xeon Gold 6248R)

**SPECrate®2017_int_base = 338**

**SPECrate®2017_int_peak = 350**

**CPU2017 License:** 3358
**Test Date:** Jul-2020

**Test Sponsor:** Inspur Corporation
**Hardware Availability:** Feb-2020

**Tested by:** Inspur Corporation
**Software Availability:** Apr-2020

---

**Compiler Version Notes (Continued)**

NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

-----------------------------------------------

| C | 500.perlbench_r(peak) 557.xz_r(peak) |
|---------------------------------------|

Intel(R) C Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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| C | 502.gcc_r(peak) |
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Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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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) C Compiler for applications running on Intel(R) 64, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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| C | 500.perlbench_r(peak) 557.xz_r(peak) |
|---------------------------------------|

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| C | 502.gcc_r(peak) |
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Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
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| C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) |
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Inspur Corporation

Inspur NF5180M5 (Intel Xeon Gold 6248R)

SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 338
SPECrate®2017_int_peak = 350

CPU2017 License: 3358
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Test Date: Jul-2020
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Compiler Version Notes (Continued)

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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

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

### Inspur Corporation

**Inspur NF5180M5 (Intel Xeon Gold 6248R)**

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**CPU2017 License:** 3358  
**Test Sponsor:** Inspur Corporation  
**Tested by:** Inspur Corporation  
**Test Date:** Jul-2020  
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### Base Portability Flags

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</tr>
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<td>-DSPEC_LP64</td>
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</table>

### Base Optimization Flags

**C benchmarks:**
- -m64 -qnextgen -std=c11
- -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
- -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
- -fuse-ld=gold -qopt-mem-layout-trans=4
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
- -lqkmalloc

**C++ benchmarks:**
- -m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
- -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
- -funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
- -lqkmalloc

**Fortran benchmarks:**
- -m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -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/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
- -lqkmalloc

### Peak Compiler Invocation

**C benchmarks:**
- icc

(Continued on next page)
## SPEC CPU®2017 Integer Rate Result

**Inspur Corporation**

Inspur NF5180M5 (Intel Xeon Gold 6248R)

### SPECrate®2017_int_base = 338

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<td>Feb-2020</td>
<td>Apr-2020</td>
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### Peak Compiler Invocation (Continued)

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

---

### Peak Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td><code>-DSPEC_LP64</code> <code>-DSPEC_LINUX_X64</code></td>
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<tr>
<td>502.gcc_r</td>
<td><code>-D_FILE_OFFSET_BITS=64</code></td>
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<tr>
<td>505.mcf_r</td>
<td><code>-DSPEC_LP64</code></td>
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<tr>
<td>520.omnetpp_r</td>
<td><code>-DSPEC_LP64</code></td>
</tr>
<tr>
<td>523.xalanchmk_r</td>
<td><code>-DSPEC_LP64</code> <code>-DSPEC_LINUX</code></td>
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<tr>
<td>525.x264_r</td>
<td><code>-DSPEC_LP64</code></td>
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<tr>
<td>531.deepsjeng_r</td>
<td><code>-DSPEC_LP64</code></td>
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<tr>
<td>541.leela_r</td>
<td><code>-DSPEC_LP64</code></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td><code>-DSPEC_LP64</code></td>
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<tr>
<td>557.xz_r</td>
<td><code>-DSPEC_LP64</code></td>
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</tbody>
</table>

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### Peak Optimization Flags

C benchmarks:
- `505.mcf_r: basepeak = yes`

(Continued on next page)
Inspecr Corporation

Inspur NF5180M5 (Intel Xeon Gold 6248R)

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**Peak Optimization Flags (Continued)**

- `525.x264_r`: -m64 -qnextgen -std=c11
- `-Wl, -plugin-opt=-x86-branches-within-32B-boundaries`
- `-Wl, -z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math`
- `-Wl,-z,muldefs -xCORE-AVX512 -std=c11 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
- `-Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math -Wl,-z,muldefs -xCORE-AVX512 -std=c11 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`

**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`

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:


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