## SPEC® CPU2017 Integer Rate Result

**Inspur Corporation**  
**Inspur NF5280M5 (Intel Xeon Gold 6140)**

**SPECrate2017_int_base** = 194  
**SPECrate2017_int_peak** = 208

### Hardware
- **CPU Name:** Intel Xeon Gold 6140  
  - **Max MHz.:** 3700  
  - **Nominal:** 2300  
  - **Enabled:** 36 cores, 2 chips, 2 threads/core  
  - **Orderable:** 1.2 chips  
  - **Cache L1:** 32 KB I + 32 KB D on chip per core  
  - **L2:** 1 MB I+D on chip per core  
  - **L3:** 24.75 MB I+D on chip per chip  
  - **Other:** None  
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)  
- **Storage:** 1 x 800 GB SATA SSD  
- **Other:** None

### Software
- **OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)  
  - **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux  
- **Firmware:** Version 3.0.4 released Sep-2017  
- **File System:** xfs  
- **System State:** Run level 5 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc: jemalloc memory allocator library, version 5.0.1

### Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
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<tr>
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<tr>
<td>xz_r</td>
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**Test Sponsor:** Inspur Corporation  
**Hardware Availability:** Aug-2017  
**Test Date:** Oct-2017  
**Software Availability:** Sep-2017
**SPEC CPU2017 Integer Rate Result**

**Inspur Corporation**

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**Results Table**

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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"

**General Notes**

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = "/home/CPU2017/lib/ia32:/home/CPU2017/lib/intel64:/home/CPU2017/je5.0.1-32:/home/CPU2017/je5.0.1-64"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

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>
```

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets

jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5


(Continued on next page)
Insper Corporation

Insper NF5280M5 (Intel Xeon Gold 6140)

SPECrate2017_int_base = 194
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CPU2017 License: 3358
Test Date: Oct-2017
Test Sponsor: Insper Corporation
Hardware Availability: Aug-2017
Tested by: Insper Corporation
Software Availability: Sep-2017

General Notes (Continued)

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: 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.
No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page. The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html. This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date. For further information and support, please see Insper's official announcement at http://en.insper.com/insper/495255/494903/2412331/index.html

Platform Notes

BIOS and OS configuration:
SCALING_GOVERNOR 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: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f running on localhost.localdomain Tue Oct 17 07:57:05 2017

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 6140 CPU @ 2.30GHz
    2 "physical id"s (chips)
    72 "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 : 18
         siblings : 36
     physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
     physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

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Platform Notes (Continued)

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
On-line CPU(s) list: 0-71
Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6140 CPU @ 2.30GHz
Stepping: 4
CPU MHz: 2999.938
CPU max MHz: 3700.0000
CPU min MHz: 1000.0000
BogoMIPS: 4589.18
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-2,5,6,9,10,14,15,36-38,41,42,45,46,50,51
NUMA node1 CPU(s): 3,4,7,8,11-13,16,17,39,40,43,44,47-49,52,53
NUMA node2 CPU(s): 18-20,23,24,27,28,32,33,54-56,59,60,63,64,68,69
NUMA node3 CPU(s): 21,22,25,26,29-31,34,35,57,58,61,62,65-67,70,71
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 ptdbg rdtsscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfperf eagerfpu pni pclmulqdq ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrr pdcm pcl dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpb intel_pt tpr_shadow vnmi flexpriority
ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsaves xsaveopt xgetbv1 cqm_llc cqm_occclus cqm_mbb_total cqm_mbb_local dtherm ida arat pln
pts hwp hwp_act_window hwp_epp hwp_pkg_req pkp orske

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 5 6 9 10 14 15 36 37 38 41 42 45 46 50 51

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INSPUR CORPORATION

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---

**Platform Notes (Continued)**

```
node 0 size: 192098 MB
node 0 free: 191547 MB
node 1 cpus: 3 4 7 8 11 12 13 16 17 39 40 43 44 47 48 49 52 53
node 1 size: 193528 MB
node 1 free: 193001 MB
node 2 cpus: 18 19 20 23 24 27 28 32 33 54 56 59 60 63 64 68 69
node 2 size: 193528 MB
node 2 free: 192995 MB
node 3 cpus: 21 22 25 26 29 30 31 34 35 57 58 61 62 66 67 70 71
node 3 size: 193525 MB
node 3 free: 192978 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:       791224612 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

---

**From /etc/*release* /etc/*version***

```
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server
```

---

```
uname -a:
Linux localhost.localdomain 3.10.4-K_UX.x86_64 #1 SMP Fri Sep 30 11:06:29 GMT 2016
x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Oct 17 07:55
```

**SPEC is set to:** /home/CPU2017

---

**Filesystem**  **Type**  **Size**  **Used**  **Avail**  **Use%**  **Mounted on**
/devmapper/rhel-home  xfs  690G  17G  674G  3%  /home

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Platform Notes (Continued)

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.

BIOS Inspur 3.0.4 09/15/2017
Memory:
24x Samsung M393A4K40CB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
     525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CC  500.perlbench_r(peak) 502.gcc_r(peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
     541.leela_r(base)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
     541.leela_r(peak)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
FC  548.exchange2_r(base, peak)
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![Image](image.png)

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### Base Optimization Flags (Continued)

- Fortran benchmarks (continued):
  - `-L/usr/local/je5.0.1-64/lib -ljemalloc`

### Base Other Flags

- C benchmarks:
  - `-m64 -std=c11`
- C++ benchmarks:
  - `-m64`
- Fortran benchmarks:
  - `-m64`

### Peak Compiler Invocation

- C benchmarks:
  - `icc`
- C++ benchmarks:
  - `icpc`
- Fortran benchmarks:
  - `ifort`

### Peak Portability Flags

- `500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64`
- `502.gcc_r: -D_FILE_OFFSET_BITS=64`
- `505.mcf_r: -DSPEC_LP64`
- `520.omnetpp_r: -DSPEC_LP64`
- `523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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`
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**Test Sponsor:** Inspur Corporation  
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**Test Date:** Oct-2017  
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**Software Availability:** Sep-2017

### Peak Optimization Flags

#### C benchmarks:

- **500.perlbench_r:** `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -o3 -no-prec-div -gopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **502.gcc_r:** `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -o3 -no-prec-div -gopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc`

- **505.mcf_r:** `-Wl,-z,muldefs -xCORE-AVX512 -ipo -o3 -no-prec-div -gopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **525.x264_r:** `-Wl,-z,muldefs -xCORE-AVX512 -ipo -o3 -no-prec-div -gopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **557.xz_r:** Same as 505.mcf_r

#### C++ benchmarks:

- **520.omnetpp_r:** `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -o3 -no-prec-div -gopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **523.xalancbmk_r:** `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -o3 -no-prec-div -gopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc`

- **531.deepsjeng_r:** Same as 520.omnetpp_r

- **541.leela_r:** Same as 520.omnetpp_r

#### Fortran benchmarks:

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -o3 -no-prec-div -gopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte -L/usr/local/je5.0.1-64/lib -ljemalloc`
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<th>SPECrate2017_int_peak</th>
</tr>
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**CPU2017 License:** 3358  
**Test Sponsor:** Inspur Corporation  
**Test Date:** Oct-2017  
**Tested by:** Inspur Corporation  
**Hardware Availability:** Aug-2017  
**Software Availability:** Sep-2017

### Peak Other Flags

**C benchmarks (except as noted below):**  
- `-m64 -std=c11`
  
  502.gcc_r: `-m32 -std=c11`

**C++ benchmarks (except as noted below):**  
- `-m64`
  
  523.xalancbmk_r: `-m32`

**Fortran benchmarks:**  
- `-m64`

The flags files that were used to format this result can be browsed at:

- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:

- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.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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