## SPEC CPU®2017 Integer Rate Result

**Inspur Electronic Information Industry Co., Ltd. (IEI)**  
**NF5180M7 (Intel Xeon Bronze 3408U)**

**CPU2017 License:** 3358  
**Test Sponsor:** Inspur Electronic Information Industry Co., Ltd. (IEI)  
**Tested by:** Inspur Electronic Information Industry Co., Ltd. (IEI)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>43.3</td>
<td>44.3</td>
</tr>
</tbody>
</table>

**Test Date:** Apr-2023  
**Hardware Availability:** Dec-2022

### Hardware

**CPU Name:** Intel Xeon Bronze 3408U

- **Max MHz:** 1900
- **Nominal:** 1800
- **Enabled:** 8 cores, 1 chip
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 48 KB D on chip per core
- **L2:** 2 MB I+D on chip per core
- **L3:** 22.5 MB I+D on chip per chip
- **Other:** None
- **Memory:** 256 GB (8 x 32 GB 2Rx4 PC5-4800B-R, running at 4000)
- **Storage:** 1 x 1 TB NVME SSD
- **Other:** None

### Software

**OS:** Red Hat Enterprise Linux 9.0 (Plow)  
5.14.0-72.22.1.el9_0.x86_64

**Compiler:**
C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;  
Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;

**Parallel:** No

**Firmware:** Version 03.01.00 released Dec-2022

**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.
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SPECrate®2017_int_base = 43.3

SPECrate®2017_int_peak = 44.3

Results Table

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<td>8</td>
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<td>523.xalancbmk_r</td>
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<td>96.0</td>
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<td>481</td>
<td>17.9</td>
<td>481</td>
<td>17.9</td>
</tr>
</tbody>
</table>

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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"

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"
```
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CPU2017 License: 3358
Test Sponsor: Insipur Electronic Information Industry Co., Ltd. (IEI)
Tested by: Insipur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Apr-2023
Hardware Availability: Apr-2023
Software Availability: Dec-2022

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
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>

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

Platform Notes

BIOS configuration:
ENERGY_PERF_BIAS_CFG mode set to Performance
Hardware Prefetch set to Disable
VT Support set to Disable
Sub NUMA Cluster (SNC) set to SNC4

Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Apr 27 14:51:28 2023

SUT (System Under Test) info as seen by some common utilities.

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12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
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18. /sys/kernel/mm/transparent_hugepage/never
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20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode

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Platform Notes (Continued)

23. BIOS

1. uname -a

Linux localhost.localdomain 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64
x86_64 x86_64 GNU/Linux

2. w

14:51:28 up 3 min, 1 user, load average: 0.01, 0.02, 0.00
USER   TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
root   tty1      14:48    8.00s  1.60s  0.02s sh
reportable-ic2023.0-lin-sapphirerapids-rate-smt-on-20221201.sh

3. Username

From environment variable $USER: root

4. ulimit -a

real-time non-blocking time (microseconds, -R) unlimited
core file size (blocks, -c) 0
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0
file size (blocks, -f) unlimited
pending signals (-i) 1030111
max locked memory (kbytes, -l) 64
max memory size (kbytes, -m) unlimited
open files (-n) 1024
pipe size (512 bytes, -p) 8
POSIX message queues (bytes, -q) 819200
real-time priority (-r) 0
stack size (kbytes, -s) unlimited
cpu time (seconds, -t) unlimited
max user processes (-u) 1030111
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

5. sysinfo process ancestry

/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
sh reportable-ic2023.0-lin-sapphirerapids-rate-smt-on-20221201.sh
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=8 --c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=4 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune base,peak -o all intrate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=8 --configfile ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=4 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower --runmode rate --tune base:peak --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.015/templogs/preenv.intrate.015.0.log --lognum 015.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/CPU2017

6. /proc/cpuinfo

model name : Intel(R) Xeon(R) Bronze 3408U
vendor_id : GenuineIntel

(Continued on next page)
### Platform Notes (Continued)

From lscpu from util-linux 2.37.4:

```
Architecture:          x86_64
CPU op-mode(s):       32-bit, 64-bit
Address sizes:        46 bits physical, 57 bits virtual
Byte Order:           Little Endian
CPU(s):               8
On-line CPU(s) list:  0-7
Vendor ID:            GenuineIntel
BIOS Vendor ID:       Intel(R) Corporation
Model name:           Intel(R) Xeon(R) Bronze 3408U
BIOS Model name:      Intel(R) Xeon(R) Bronze 3408U
CPU family:           6
Model:                143
Thread(s) per core:   1
Core(s) per socket:   8
Socket(s):            1
Stepping:             7
CPU max MHz:          1900.000
CPU min MHz:          800.000
BogoMIPS:             3600.00
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 b pundep nopl xtopology
```

**CPU family**: 6
**model**: 143
**stepping**: 7
**microcode**: 0x2b000130
**bugs**: spectre_v1 spectre_v2 spec_store_bypass swapgs
**cpu cores**: 8
**siblings**: 8
1 physical id (chips)
8 processors (hardware threads)
0 physical id: core ids 0-7
0 physical id: apicids 0,2,4,6,8,10,12,14

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

---

7. `lscpu`

---

(Continued on next page)
Platform Notes (Continued)

NUMA node1 CPU(s): 4-7
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spectre store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Tsx async abort: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d  48K   384K   12 Data  1 64 1 64
L1i  32K   256K   8 Instruction  1 64 1 64
L2   2M    16M   16 Unified  2 2048 1 64
L3  22.5M  22.5M  15 Unified  3 24576 1 64

8. numactl --hardware
   NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 2 nodes (0-1)
   node 0 cpus: 0-3
   node 0 size: 128592 MB
   node 0 free: 128048 MB
   node 1 cpus: 4-7
   node 1 size: 128975 MB
   node 1 free: 128511 MB
   node distances:
   node 0 1
   0: 10 12
   1: 12 10

9. /proc/meminfo
   MemTotal: 263749372 kB

10. who -r
    run-level 3 Apr 27 14:48

11. Systemd service manager version: systemd 250 (250-6.e19_0)
    Default Target Status
    multi-user degraded

12. Failed units, from systemctl list-units --state=failed
   UNIT LOAD ACTIVE SUB DESCRIPTION
   * sep5.service loaded failed failed systemd script to load sep5 driver at boot time

13. Services, from systemctl list-unit-files
   STATE UNIT FILES
   enabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
dbus-broker firewalld gettty@ irqbalance kdump lvm2-monitor mdmonitor microcode
nis-domainname rhsncertd rsynclog selinux-autorelabel-mark sep5 sshd sssd
systemd-network-generator udisks2 upower
   enabled-runtime systemd-remount-fs
   disabled blk-availability canberra-system-bootup canberra-system-shutdown

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Platform Notes (Continued)

14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
   root=/dev/mapper/rhel-root
   ro
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap

15. cpupower frequency-info
    analyzing CPU 0:
       current policy: frequency should be within 800 MHz and 1.90 GHz.
       The governor "performance" may decide which speed to use
       within this range.
       boost state support:
       Supported: yes
       Active: yes

16. sysctl
    kernel.numa_balancing               1
    kernel.randomize_va_space           2
    vm.compaction_proactiveness         20
    vm.dirty_background_bytes           0
    vm.dirty_background_ratio           10
    vm.dirty_bytes                      0
    vm.dirty_expire_centisecs           3000
    vm.dirty_ratio                      20
    vm.dirty_writeback_centisecs        500
    vm.dirtytime_expire_seconds         43200
    vm.extrfrag_threshold               500
    vm.min_unmapped_ratio               1
    vm.nr_hugepages                     0
    vm.nr_hugepages_mempolicy           0
    vm.nr_overcommit_hugepages          0
    vm.swappiness                       60
    vm.watermark_boost_factor           15000
    vm.watermark_scale_factor           10
    vm.zone_reclaim_mode                0

17. /sys/kernel/mm/transparent_hugepage
    defrag always defer+madvice [madvice] never
    enabled [always] madvice never
    hpage_pmd_size 2097152
    shmemp_enabled always within_size advise [never] deny force

18. /sys/kernel/mm/transparent_hugepage/klhugepaged
    alloc_sleep_millisecs 60000
    defrag 1
    max_ptes_none 511
    max_ptes_shared 256
    max_ptes_swap 64

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Platform Notes (Continued)

```plaintext
pages_to_scan  4096
scan_sleep_milliseconds  10000
```

19. OS release
From /etc/*-release /etc/*-version
os-release Red Hat Enterprise Linux 9.0 (Plow)
redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
system-release Red Hat Enterprise Linux release 9.0 (Plow)

20. Disk information
SPEC is set to: /home/CPU2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs  819G  127G  692G  16% /home

21. /sys/devices/virtual/dmi/id
Vendor: IEI
Product: NF5180M7
Product Family: Not specified
Serial: 000000000

22. dmidecode
Additional information from dmidecode 3.3 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:
8x Samsung M321R4GA3BB6-CQKVG 32 GB 2 rank 4800, configured at 4000

23. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 03.01.00
BIOS Date: 12/29/2022

Compiler Version Notes

```plaintext
C | 502.gcc_r(peak)
```

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
```

```
C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
  557.xz_r(base, peak)
```

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
```

```
C | 502.gcc_r(peak)
```

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**Compiler Version Notes (Continued)**

```plaintext
---

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Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
---

C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
---

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
---

C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
---

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
---

Fortran | 548.exchange2_r(base, peak)
---

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
---

(Continued on next page)
```

---

**Base Compiler Invocation**

**C benchmarks:**
- icx

**C++ benchmarks:**
- icpx

**Fortran benchmarks:**
- ifx

---

**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
```

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**SPEC CPU®2017 Integer Rate Result**

**Inspur Electronic Information Industry Co., Ltd. (IEI)**

<table>
<thead>
<tr>
<th>NF5180M7 (Intel Xeon Bronze 3408U)</th>
<th>SPECrate®2017_int_base = 43.3</th>
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<tbody>
<tr>
<td></td>
<td>SPECrate®2017_int_peak = 44.3</td>
</tr>
</tbody>
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**CPU2017 License:** 3358  
**Test Sponsor:** Inspur Electronic Information Industry Co., Ltd. (IEI)  
**Test Date:** Apr-2023  
**Tested by:** Inspur Electronic Information Industry Co., Ltd. (IEI)  
**Hardware Availability:** Apr-2023  
**Software Availability:** Dec-2022

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### Base Portability Flags (Continued)

- `541.leela_r`: `-DSPEC_LP64`
- `548.exchange2_r`: `-DSPEC_LP64`
- `557.xz_r`: `-DSPEC_LP64`

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### Base Optimization Flags

**C benchmarks:**

- `w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`
- `flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**C++ benchmarks:**

- `w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`
- `flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**Fortran benchmarks:**

- `w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto`
- `mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `nostandard-realloc-lhs -align array32byte -auto`
- `-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

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### Peak Compiler Invocation

**C benchmarks:**

- `icx`

**C++ benchmarks:**

- `icpx`

**Fortran benchmarks:**

- `ifx`

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### Peak Portability Flags

- `500.perlbench_r`: `-DSPEC_LP64 -DSPEC_LINUX_X64`

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Peak Portability Flags (Continued)

502.gcc_r: -D_FILE_OFFSET_BITS=64
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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -w -std=c11 -m64 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/ia32_lin
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: basepeak = yes

C++ benchmarks:

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NF5180M7 (Intel Xeon Bronze 3408U)

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Peak Optimization Flags (Continued)

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
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2023-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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