SPEC CPU®2017 Integer Rate Result

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

$SPECrate®2017\_int\_base = 213$

NF5280M7 (Intel Xeon Silver 4410T)

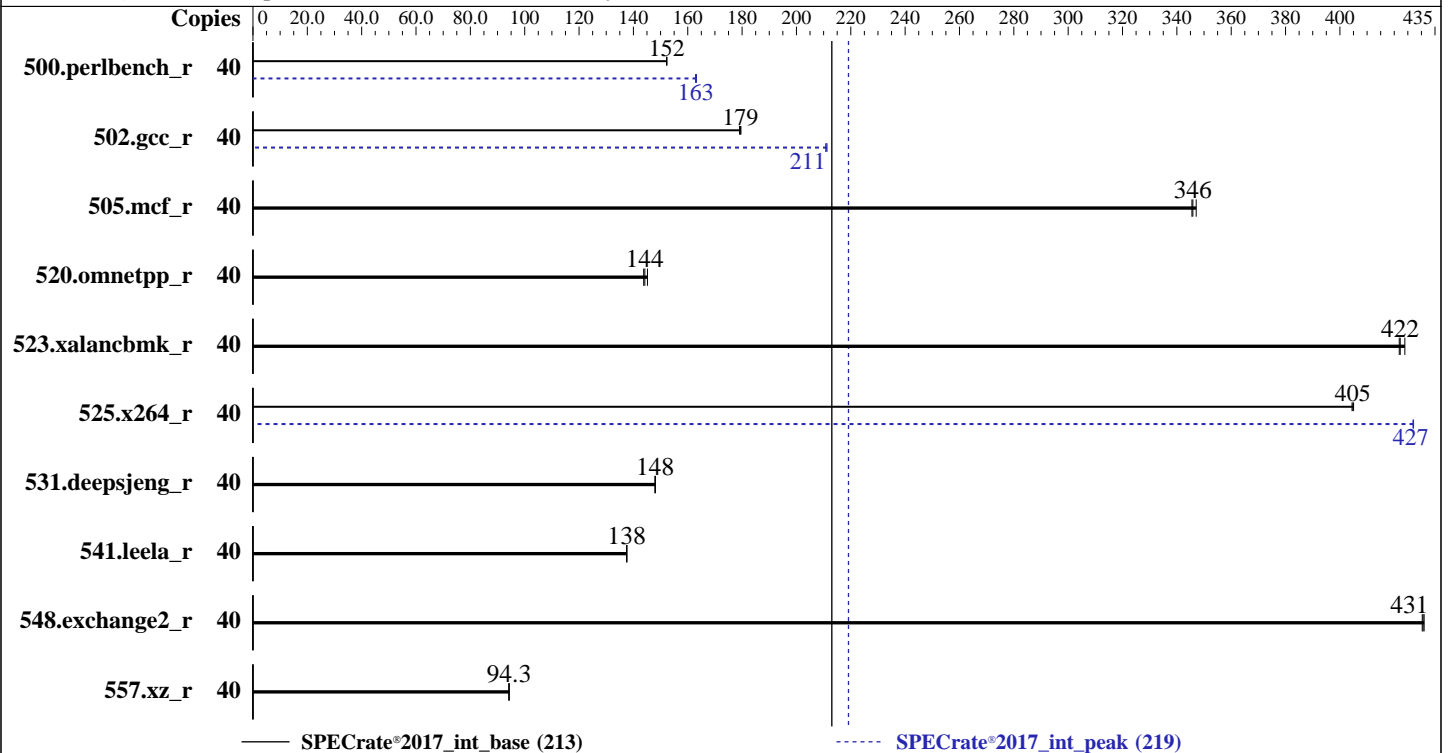$SPECrate®2017\_int\_peak = 219$

CPU2017 License: 3358

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Apr-2023

Hardware Availability: Apr-2023

Software Availability: Feb-2023

Benchmark results (Copies = 40):

Benchmark	base	peak
500.perlbench_r	152	163
502.gcc_r	179	211
505.mcf_r	346	
520.omnetpp_r	144	
523.xalancbmk_r	422	
525.x264_r	405	427
531.deepsjeng_r	148	
541.leela_r	138	
548.exchange2_r	431	
557.xz_r	94.3	

SPECrate®2017_int_base (213) · SPECrate®2017_int_peak (219)

Hardware

CPU Name: Intel Xeon Silver 4410T
 Max MHz: 4000
 Nominal: 2700
Enabled: 20 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 26.25 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 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) 5.14.0-70.22.1.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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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	40	418	152	418	152	**418**	**152**	40	**391**	**163**	390	163	391	163
502.gcc_r	40	**316**	**179**	316	179	315	180	40	**269**	**211**	269	211	268	211
505.mcf_r	40	186	347	**187**	**346**	187	346	40	186	347	**187**	**346**	187	346
520.omnetpp_r	40	361	145	365	144	**364**	**144**	40	361	145	365	144	**364**	**144**
523.xalancbmk_r	40	100	422	**100**	**422**	99.6	424	40	100	422	**100**	**422**	99.6	424
525.x264_r	40	173	405	173	404	**173**	**405**	40	164	427	164	427	**164**	**427**
531.deepsjeng_r	40	**310**	**148**	310	148	310	148	40	**310**	**148**	310	148	310	148
541.leela_r	40	481	138	**482**	**138**	482	137	40	481	138	**482**	**138**	482	137
548.exchange2_r	40	243	431	**243**	**431**	244	430	40	243	431	**243**	**431**	244	430
557.xz_r	40	458	94.3	459	94.1	**458**	**94.3**	40	458	94.3	459	94.1	**458**	**94.3**
SPECrate®2017_int_base =		213												
SPECrate®2017_int_peak =		219												

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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.xalancbmk_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"
```

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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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
sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

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 Tue Apr  4 05:57:20 2023

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

-----------------------------------------------------------
Table of contents
-----------------------------------------------------------
 1. uname -a
 2. w
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 8. numactl --hardware
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 250 (250-6.el9_0)
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
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
```

(Continued on next page)

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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
      05:57:20 up 4 min,  1 user,  load average: 0.06, 0.02, 0.00
     USER     TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
     root     tty1        05:57    8.00s  0.82s  0.00s -bash

   ------------------------------------------------------------
   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) 2062255
     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) 2062255
     virtual memory              (kbytes, -v) unlimited
     file locks                          (-x) unlimited

   ------------------------------------------------------------
   5. sysinfo process ancestry
    /usr/lib/systemd/systemd --switched-root --system --deserialize 27
    login -- root
    -bash
    -bash
    runcpu --nobuild --action validate --define default-platform-flags --define numcopies=40 -c
      ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=20 --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=40 --configfile
      ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=20 --define physicalfirst
      --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
      --runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
      $SPEC/tmp/CPU2017.003/templogs/preenv.intrate.003.0.log --lognum 003.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
   $SPEC = /home/CPU2017

   ------------------------------------------------------------
   6. /proc/cpuinfo
       model name      : Intel(R) Xeon(R) Silver 4410T
       vendor_id       : GenuineIntel
       cpu family      : 6
```

(Continued on next page)

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Platform Notes (Continued)

```
      model           : 143
      stepping        : 7
      microcode       : 0x2b000130
      bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
      cpu cores       : 10
      siblings        : 20
      2 physical ids (chips)
      40 processors (hardware threads)
      physical id 0: core ids 0-9
      physical id 1: core ids 0-9
      physical id 0: apicids 0-19
      physical id 1: apicids 128-147
   Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
   virtualized systems.  Use the above data carefully.


   ------------------------------------------------------------
7. lscpu

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):                 40
   On-line CPU(s) list:    0-39
   Vendor ID:              GenuineIntel
   BIOS Vendor ID:         Intel(R) Corporation
   Model name:             Intel(R) Xeon(R) Silver 4410T
   BIOS Model name:        Intel(R) Xeon(R) Silver 4410T
   CPU family:             6
   Model:                  143
   Thread(s) per core:     2
   Core(s) per socket:     10
   Socket(s):              2
   Stepping:               7
   CPU max MHz:            4000.0000
   CPU min MHz:            800.0000
   BogoMIPS:               5400.00
   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 bts rep_good nopl xtopology
                           nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                           ds_cpl 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 cat_l2 cdp_l3 invpcid_single
                           intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase
                           tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq
                           rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni
                           avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                           cqm_mbm_total cqm_mbm_local split_lock_detect avx_vnni avx512_bf16
                           wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req
                           avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq
                           avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid bus_lock_detect
                           cldemote movdiri movdir64b enqcmd fsrm md_clear serialize tsxldtrk pconfig
                           arch_lbr avx512_fp16 amx_tile flush_l1d arch_capabilities
   L1d cache:              960 KiB (20 instances)
   L1i cache:              640 KiB (20 instances)
   L2 cache:               40 MiB (20 instances)
   L3 cache:               52.5 MiB (2 instances)
   NUMA node(s):           4
```

(Continued on next page)

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Platform Notes (Continued)

```
  NUMA node0 CPU(s):           0-4,20-24
  NUMA node1 CPU(s):           5-9,25-29
  NUMA node2 CPU(s):           10-14,30-34
  NUMA node3 CPU(s):           15-19,35-39
  Vulnerability Itlb multihit:   Not affected
  Vulnerability L1tf:            Not affected
  Vulnerability Mds:             Not affected
  Vulnerability Meltdown:        Not affected
  Vulnerability Spec 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 Srbds:           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     960K   12 Data            1    64    1            64
      L1i      32K     640K    8 Instruction     1    64    1            64
      L2        2M      40M   16 Unified         2  2048    1            64
      L3     26.3M    52.5M   15 Unified         3 28672    1            64


  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 4 nodes (0-3)
    node 0 cpus: 0-4,20-24
    node 0 size: 128585 MB
    node 0 free: 128205 MB
    node 1 cpus: 5-9,25-29
    node 1 size: 129021 MB
    node 1 free: 128492 MB
    node 2 cpus: 10-14,30-34
    node 2 size: 129021 MB
    node 2 free: 128741 MB
    node 3 cpus: 15-19,35-39
    node 3 size: 128974 MB
    node 3 free: 128743 MB
    node distances:
    node   0   1   2   3
      0:  10  12  21  21
      1:  12  10  21  21
      2:  21  21  10  12
      3:  21  21  12  10


  ------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       527978260 kB


  ------------------------------------------------------------
  10. who -r
    run-level 3 Apr 4 05:52


  ------------------------------------------------------------
  11. Systemd service manager version: systemd 250 (250-6.el9_0)
    Default Target  Status
    multi-user      degraded


  ------------------------------------------------------------
  12. Failed units, from systemctl list-units --state=failed
      UNIT                          LOAD   ACTIVE SUB    DESCRIPTION
```

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Platform Notes (Continued)

```
     * NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online
     * 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 getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
                       nis-domainname rhsmcertd rsyslog 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
                       canberra-system-shutdown-reboot chrony-wait console-getty cpupower debug-shell kvm_stat
                       man-db-restart-cache-update nftables rdisc rhsm rhsm-facts rpmdb-rebuild serial-getty@
                       sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
    indirect           sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

    ----------------------------------------------------------
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 4.00 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.extfrag_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
```

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Platform Notes (Continued)

```
  defrag          always defer defer+madvise [madvise] never
  enabled         [always] madvise never
  hpage_pmd_size  2097152
  shmem_enabled   always within_size advise [never] deny force


  ----------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    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  144G  676G  18% /home

  ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:        IEIT
    Product:       NF5280M7
    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:
    16x 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

```
==================================================================================================
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.
```

(Continued on next page)

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Compiler Version Notes (Continued)

```
----------------------------------------------------------------------------------------------

==============================================================================================
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)
----------------------------------------------------------------------------------------------
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
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----------------------------------------------------------------------------------------------


==============================================================================================
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 2023.0.0 Build 20221201
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----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 548.exchange2_r(base, peak)
----------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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----------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

SPEC CPU®2017 Integer Rate Result

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

NF5280M7 (Intel Xeon Silver 4410T)

SPECrate®2017_int_base = 213

SPECrate®2017_int_peak = 219

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 -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
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

SPEC CPU®2017 Integer Rate Result

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

NF5280M7 (Intel Xeon Silver 4410T)

$SPECrate^{®}2017\_int\_base = 213$

$SPECrate^{®}2017\_int\_peak = 219$

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

Test Date: Apr-2023
Hardware Availability: Apr-2023
Software Availability: Feb-2023

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: `-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:

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

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

NF5280M7 (Intel Xeon Silver 4410T)

SPECrate®2017_int_base = 213

SPECrate®2017_int_peak = 219

CPU2017 License: 3358

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Apr-2023

Hardware Availability: Apr-2023

Software Availability: Feb-2023

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`
`http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-intel-V3.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`
`http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-intel-V3.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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