SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

ThinkSystem SR250 V3
(2.60 GHz, Intel Xeon E-2414)

$SPECrate®2017\_int\_base = 39.6$

$SPECrate®2017\_int\_peak = 41.0$

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Jan-2024
Hardware Availability: Feb-2024
Software Availability: Dec-2023

Benchmark	Copies	Base	Peak
500.perlbench_r	4	31.8	35.8
502.gcc_r	4	38.0	44.8
505.mcf_r	4	63.1	
520.omnetpp_r	4	24.2	
523.xalancbmk_r	4	57.8	
525.x264_r	4	93.4	99.5
531.deepsjeng_r	4	29.4	
541.leela_r	4	24.8	
548.exchange2_r	4	89.1	
557.xz_r	4	14.8	

SPECrate®2017_int_base (39.6)   SPECrate®2017_int_peak (41.0)

Hardware

CPU Name: Intel Xeon E-2414
 Max MHz: 4500
 Nominal: 2600
Enabled: 4 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: 12 MB I+D on chip per chip
 Other: None
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-4800B-E, running at 4400)
Storage: 1 x 480 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.3 (Plow)
 Kernel 5.14.0-362.8.1.el9_3.x86_64
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Lenovo BIOS Version CTE101Z 1.10 released Dec-2023
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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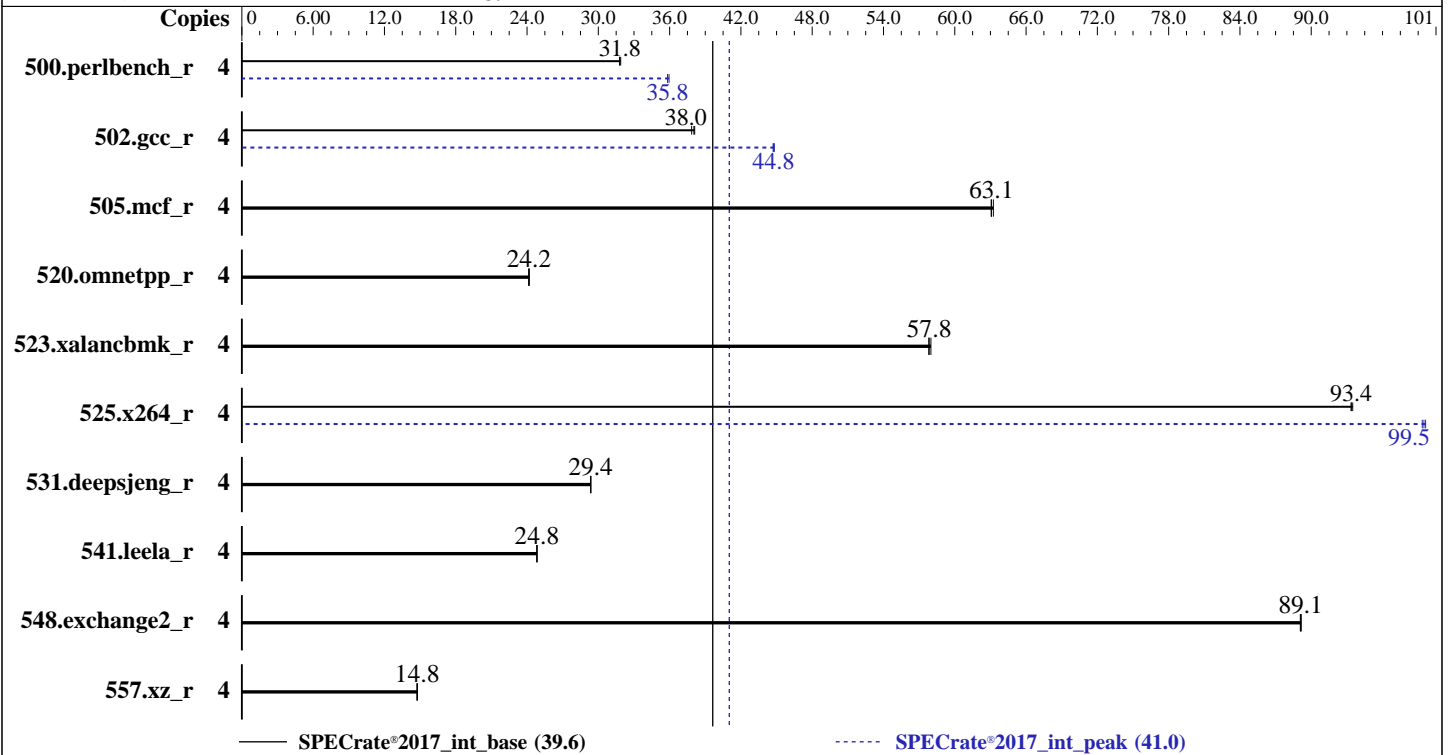**CPU2017 License:** 9017　　　　　　　　　　　　　　　　　**Test Date:** Jan-2024
Test Sponsor: Lenovo Global Technology　　　　　　　**Hardware Availability:** Feb-2024
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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	4	200	31.8	200	31.9	**200**	**31.8**	4	177	36.0	178	35.8	**178**	**35.8**
502.gcc_r	4	**149**	**38.0**	150	37.9	149	38.1	4	127	44.7	126	44.8	**127**	**44.8**
505.mcf_r	4	102	63.2	**102**	**63.1**	102	63.1	4	102	63.2	**102**	**63.1**	102	63.1
520.omnetpp_r	4	217	24.2	217	24.1	**217**	**24.2**	4	217	24.2	217	24.1	**217**	**24.2**
523.xalancbmk_r	4	73.1	57.8	72.8	58.0	**73.0**	**57.8**	4	73.1	57.8	72.8	58.0	**73.0**	**57.8**
525.x264_r	4	75.0	93.4	**75.0**	**93.4**	74.9	93.5	4	70.5	99.3	**70.4**	**99.5**	70.3	99.6
531.deepsjeng_r	4	156	29.4	**156**	**29.4**	156	29.4	4	156	29.4	**156**	**29.4**	156	29.4
541.leela_r	4	**267**	**24.8**	267	24.8	267	24.8	4	**267**	**24.8**	267	24.8	267	24.8
548.exchange2_r	4	118	89.2	118	89.1	**118**	**89.1**	4	118	89.2	118	89.1	**118**	**89.1**
557.xz_r	4	**293**	**14.8**	293	14.7	293	14.8	4	**293**	**14.8**	293	14.7	293	14.8
SPECrate®2017_int_base =		**39.6**											
SPECrate®2017_int_peak =		**41.0**											

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate taskset 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/cpu2017-1.1.9-ic2023.2.3/lib/intel64:/home/cpu2017-1.1.9-ic2023.2.3/lib/ia32:/home/cpu2017-1.1.
    9-ic2023.2.3/je5.0.1-32"
MALLOC_CONF = "retain:true"

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
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.

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General Notes (Continued)

```
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:
Choose Operating Mode set to Maximum Performance
Turbo Limit for 95W CPU set to Disabled

 Sysinfo program /home/cpu2017-1.1.9-ic2023.2.3/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Sun Jan 21 14:54:35 2024

 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 252 (252-18.el9)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 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
 23. BIOS
 ------------------------------------------------------------


 ------------------------------------------------------------
 1. uname -a
   Linux localhost.localdomain 5.14.0-362.8.1.el9_3.x86_64 #1 SMP PREEMPT_DYNAMIC Tue Oct 3 11:12:36 EDT 2023
   x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
   14:54:35 up 1 min,  1 user,  load average: 0.03, 0.02, 0.00
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1       14:54    6.00s  0.71s  0.00s -bash


 ------------------------------------------------------------
 3. Username
   From environment variable $USER:  root
```

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Platform Notes (Continued)

```
          ----------------------------------------------------------
          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) 256661
            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) 256661
            virtual memory              (kbytes, -v) unlimited
            file locks                       (-x) unlimited


          ----------------------------------------------------------
          5. sysinfo process ancestry
           /usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
           login -- root
           -bash
           -bash
           runcpu --nobuild --action validate --define default-platform-flags --define numcopies=4 -c
             ic2023.2.3-lin-core-avx2-rate-20231121.cfg --define cores=4 --define physicalfirst --define no-numa --tune
             base,peak -o all --define drop_caches intrate
           runcpu --nobuild --action validate --define default-platform-flags --define numcopies=4 --configfile
             ic2023.2.3-lin-core-avx2-rate-20231121.cfg --define cores=4 --define physicalfirst --define no-numa --tune
             base,peak --output_format all --define drop_caches --nopower --runmode rate --tune base:peak --size
             refrate intrate --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.059/templogs/preenv.intrate.059.0.log
             --lognum 059.0 --from_runcpu 2
           specperl $SPEC/bin/sysinfo
          $SPEC = /home/cpu2017-1.1.9-ic2023.2.3


          ----------------------------------------------------------
          6. /proc/cpuinfo
              model name      : Intel(R) Xeon(R) E E-2414
              vendor_id       : GenuineIntel
              cpu family      : 6
              model           : 183
              stepping        : 1
              microcode       : 0x11f
              bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
              cpu cores       : 4
              siblings        : 4
              1 physical ids (chips)
              4 processors (hardware threads)
              physical id 0: core ids 0-3
              physical id 0: apicids 0,2,4,6
            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
```

(Continued on next page)

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Platform Notes (Continued)

```
CPU op-mode(s):                 32-bit, 64-bit
Address sizes:                  42 bits physical, 48 bits virtual
Byte Order:                     Little Endian
CPU(s):                         4
On-line CPU(s) list:            0-3
Vendor ID:                      GenuineIntel
BIOS Vendor ID:                 Intel(R) Corporation
Model name:                     Intel(R) Xeon(R) E E-2414
BIOS Model name:                Intel(R) Xeon(R) E E-2414
CPU family:                     6
Model:                          183
Thread(s) per core:             1
Core(s) per socket:             4
Socket(s):                      1
Stepping:                       1
BogoMIPS:                       5222.40
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 vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
                                sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
                                rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb ssbd ibrs ibpb stibp
                                ibrs_enhanced tpr_shadow flexpriority ept vpid ept_ad fsgsbase
                                tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed adx smap clflushopt
                                clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves split_lock_detect
                                avx_vnni dtherm ida arat pln pts hfi vnmi umip pku ospke waitpkg gfni
                                vaes vpclmulqdq tme rdpid movdiri movdir64b fsrm md_clear serialize
                                pconfig arch_lbr ibt flush_l1d arch_capabilities
Virtualization:                 VT-x
L1d cache:                      192 KiB (4 instances)
L1i cache:                      128 KiB (4 instances)
L2 cache:                       8 MiB (4 instances)
L3 cache:                       12 MiB (1 instance)
NUMA node(s):                   1
NUMA node0 CPU(s):              0-3
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:    Not affected
Vulnerability L1tf:             Not affected
Vulnerability Mds:              Not affected
Vulnerability Meltdown:         Not affected
Vulnerability Mmio stale data:  Not affected
Vulnerability Retbleed:         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 / Automatic IBRS, IBPB conditional, RSB filling,
                                PBRSB-eIBRS SW sequence
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     192K   12 Data             1    64        1             64
    L1i       32K     128K    8 Instruction      1    64        1             64
    L2         2M       8M   16 Unified          2  2048        1             64
    L3        12M      12M    6 Unified          3 32768        1             64


------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
```

(Continued on next page)

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Platform Notes (Continued)

```
   available: 1 nodes (0)
   node 0 cpus: 0-3
   node 0 size: 64208 MB
   node 0 free: 63568 MB
   node distances:
   node   0
     0:  10


  ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       65749252 kB


  ----------------------------------------------------------
10. who -r
   run-level 3 Jan 21 14:53


  ----------------------------------------------------------
11. Systemd service manager version: systemd 252 (252-18.el9)
   Default Target  Status
   multi-user      running


  ----------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE            UNIT FILES
   enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online atd auditd bluetooth
                    chronyd crond dbus-broker firewalld getty@ insights-client-boot irqbalance iscsi
                    iscsi-onboot kdump libstoragemgmt low-memory-monitor lvm2-monitor mcelog mdmonitor
                    microcode multipathd nis-domainname nvmefc-boot-connections rhsmcertd rsyslog rtkit-daemon
                    selinux-autorelabel-mark smartd sshd sssd systemd-boot-update systemd-network-generator
                    tuned udisks2 upower
   enabled-runtime  systemd-remount-fs
   disabled         arp-ethers blk-availability canberra-system-bootup canberra-system-shutdown
                    canberra-system-shutdown-reboot chrony-wait console-getty cpupower debug-shell
                    dnf-system-upgrade iprdump iprinit iprupdate iscsid iscsiuio kpatch kvm_stat ledmon
                    man-db-restart-cache-update nftables nvmf-autoconnect pesign psacct rdisc rhcd rhsm
                    rhsm-facts rpmdb-rebuild selinux-check-proper-disable 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 systemd-sysupdate
                    systemd-sysupdate-reboot

  ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-362.8.1.el9_3.x86_64
   root=/dev/mapper/rhel-root
   ro
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap
   rhgb
   quiet


  ----------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     Unable to determine current policy
     boost state support:
       Supported: yes
       Active: yes

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

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Platform Notes (Continued)

```
  15. tuned-adm active
    Current active profile: throughput-performance


    ----------------------------------------------------------
  16. sysctl
    kernel.numa_balancing              0
    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                     40
    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                      10
    vm.watermark_boost_factor          15000
    vm.watermark_scale_factor          10
    vm.zone_reclaim_mode               0


    ----------------------------------------------------------
  17. /sys/kernel/mm/transparent_hugepage
    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 9.3 (Plow)
    redhat-release Red Hat Enterprise Linux release 9.3 (Plow)
    system-release Red Hat Enterprise Linux release 9.3 (Plow)


    ----------------------------------------------------------
  20. Disk information
  SPEC is set to: /home/cpu2017-1.1.9-ic2023.2.3
    Filesystem            Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs   344G   14G  330G   5% /home


    ----------------------------------------------------------
  21. /sys/devices/virtual/dmi/id
      Vendor:         Lenovo
      Product:        ThinkSystem SR250 V3
      Product Family: ThinkSystem
```

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Platform Notes (Continued)

```
      Serial:         1234567890


    -------------------------------------------------------------
 22. dmidecode
   Additional information from dmidecode 3.5 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:
     1x Samsung M324R4GA3BB0-CQKOD 32 GB 2 rank 4800, configured at 4400
     1x Samsung M324R4GA3BB0-CQKOL 32 GB 2 rank 4800, configured at 4400


    -------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:      Lenovo
   BIOS Version:     CTE101Z-1.10
   BIOS Date:        12/27/2023
   BIOS Revision:    1.10
   Firmware Revision: 1.10
```

Compiler Version Notes

```
==================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------


==================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
```

(Continued on next page)

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Compiler Version Notes (Continued)

```
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------


===============================================================================
Fortran | 548.exchange2_r(base, peak)
-------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------
```

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`
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-AVX2 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin -lqkmalloc`

SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

ThinkSystem SR250 V3
(2.60 GHz, Intel Xeon E-2414)

SPECrate®2017_int_base = 39.6

SPECrate®2017_int_peak = 41.0

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jan-2024

Hardware Availability: Feb-2024

Software Availability: Dec-2023

Base Optimization Flags (Continued)

C++ benchmarks:

```
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Peak Compiler Invocation

C benchmarks:

```
icx
```

C++ benchmarks:

```
icpx
```

Fortran benchmarks:

```
ifx
```

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`

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

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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 -flto`
`-Ofast -ffast-math -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-strict-overflow`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

502.gcc_r: `-m32`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/ia32_lin`
`-std=gnu89 -Wl,-z,muldefs -fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX2 -flto`
`-Ofast -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 -xCORE-AVX2 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-alias`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

557.xz_r: `basepeak = yes`

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
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Catlow-A.html
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.html

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CPU2017 License: 9017		**Test Date:**	Jan-2024
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Feb-2024
Tested by:	Lenovo Global Technology	**Software Availability:**	Dec-2023

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Catlow-A.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml

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

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