# SPEC CPU®2017 Integer Speed Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

## Lenovo Global Technology

$SPECspeed®2017\_int\_base =$ 14.7

ThinkSystem SR650 V3
(2.10 GHz, Intel Xeon Platinum 8470Q)

$SPECspeed®2017\_int\_peak =$ Not Run

| | |
|---|---|
| **CPU2017 License:** 9017 | **Test Date:** Oct-2023 |
| **Test Sponsor:** Lenovo Global Technology | **Hardware Availability:** May-2023 |
| **Tested by:** Lenovo Global Technology | **Software Availability:** May-2023 |

**Threads**

| Benchmark | Threads | Value |
|---|---|---|
| 600.perlbench_s | 208 | 9.26 |
| 602.gcc_s | 208 | 11.9 |
| 605.mcf_s | 208 | 22.1 |
| 620.omnetpp_s | 208 | 12.0 |
| 623.xalancbmk_s | 208 | 28.7 |
| 625.x264_s | 208 | 21.2 |
| 631.deepsjeng_s | 208 | 6.97 |
| 641.leela_s | 208 | 5.68 |
| 648.exchange2_s | 208 | 25.2 |
| 657.xz_s | 208 | 27.0 |

——— SPECspeed®2017_int_base (14.7)

## Hardware

CPU Name: Intel Xeon Platinum 8470Q
 Max MHz: 3800
 Nominal: 2100
Enabled: 104 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: 105 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 960 GB SATA SSD
Other: None

## Software

OS: Red Hat Enterprise Linux 9.2 (Plow) (x86_64)
 Kernel 5.14.0-284.11.1.el9_2.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: Yes
Firmware: Lenovo BIOS Version ESE117F 2.22 released Aug-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
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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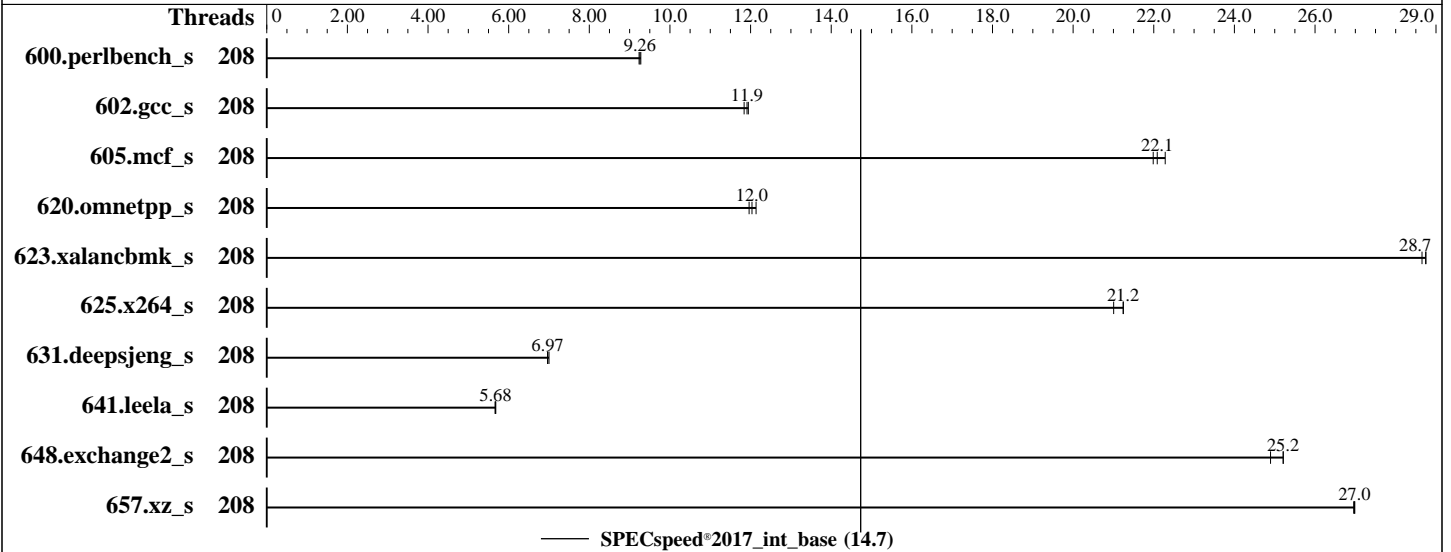
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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 600.perlbench_s | 208 | **192** | **9.26** | 192 | 9.23 | 191 | 9.28 | | | | | | | |
| 602.gcc_s | 208 | 336 | 11.8 | 333 | 11.9 | **334** | **11.9** | | | | | | | |
| 605.mcf_s | 208 | **214** | **22.1** | 215 | 22.0 | 212 | 22.3 | | | | | | | |
| 620.omnetpp_s | 208 | 136 | 12.0 | **136** | **12.0** | 134 | 12.1 | | | | | | | |
| 623.xalancbmk_s | 208 | 49.5 | 28.7 | **49.3** | **28.7** | 49.3 | 28.8 | | | | | | | |
| 625.x264_s | 208 | 84.0 | 21.0 | **83.1** | **21.2** | 83.0 | 21.2 | | | | | | | |
| 631.deepsjeng_s | 208 | 206 | 6.97 | **206** | **6.97** | 205 | 7.00 | | | | | | | |
| 641.leela_s | 208 | **301** | **5.68** | 301 | 5.66 | 300 | 5.68 | | | | | | | |
| 648.exchange2_s | 208 | **117** | **25.2** | 118 | 24.9 | 117 | 25.2 | | | | | | | |
| 657.xz_s | 208 | 229 | 27.0 | **229** | **27.0** | 229 | 27.0 | | | | | | | |
| **SPECspeed®2017_int_base =** | | | | **14.7** | | | | | | | | | | |
| **SPECspeed®2017_int_peak =** | | | | **Not Run** | | | | | | | | | | |

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.
```

## 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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.9-ic2023.0-2/lib/intel64:/home/cpu2017-1.1.9-ic2023.0-2/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

## General Notes

```
 Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
 memory using Redhat Enterprise Linux 8.0
 Transparent Huge Pages enabled by default
 Prior to runcpu invocation
```

**(Continued on next page)**

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

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## General Notes (Continued)

```
 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.
 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:
Operating Mode set to Custom Mode
CPU P-state Control set to Legacy

 Sysinfo program /home/cpu2017-1.1.9-ic2023.0-2/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Tue Oct 17 03:46:09 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 252 (252-13.el9_2)
 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 5.14.0-284.11.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 12 10:45:03 EDT
   2023 x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
```

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## Platform Notes (Continued)

```
   03:46:10 up 9 min,  1 user,  load average: 0.00, 1.30, 1.39
   USER     TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1        03:44    41.00s 1.72s  0.01s -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) 2062476
      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) 2062476
      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 -c
       ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=104 --tune base -o all --define
       intspeedaffinity --define smt-on --define drop_caches intspeed
     runcpu --nobuild --action validate --define default-platform-flags --configfile
       ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=104 --tune base --output_format all --define
       intspeedaffinity --define smt-on --define drop_caches --nopower --runmode speed --tune base --size
       refspeed intspeed --nopreenv --note-preenv --logfile
       $SPEC/tmp/CPU2017.060/templogs/preenv.intspeed.060.0.log --lognum 060.0 --from_runcpu 2
     specperl $SPEC/bin/sysinfo
     $SPEC = /home/cpu2017-1.1.9-ic2023.0-2


    ------------------------------------------------------------
    6. /proc/cpuinfo
       model name      : Intel(R) Xeon(R) Platinum 8470Q
       vendor_id       : GenuineIntel
       cpu family      : 6
       model           : 143
       stepping        : 8
       microcode       : 0x2b0004b1
       bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
       cpu cores       : 52
       siblings        : 104
       2 physical ids (chips)
       208 processors (hardware threads)
       physical id 0: core ids 0-51
       physical id 1: core ids 0-51
```

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## Platform Notes (Continued)

```
      physical id 0: apicids 0-103
      physical id 1: apicids 128-231
   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):                      208
     On-line CPU(s) list:         0-207
     Vendor ID:                   GenuineIntel
     BIOS Vendor ID:              Intel(R) Corporation
     Model name:                  Intel(R) Xeon(R) Platinum 8470Q
     BIOS Model name:             Intel(R) Xeon(R) Platinum 8470Q
     CPU family:                  6
     Model:                       143
     Thread(s) per core:          2
     Core(s) per socket:          52
     Socket(s):                   2
     Stepping:                    8
     BogoMIPS:                    4200.00
     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 vmx 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
                                  tpr_shadow vnmi flexpriority ept vpid ept_ad 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 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 ibt amx_bf16 avx512_fp16 amx_tile amx_int8
                                  flush_l1d arch_capabilities
     Virtualization:              VT-x
     L1d cache:                   4.9 MiB (104 instances)
     L1i cache:                   3.3 MiB (104 instances)
     L2 cache:                    208 MiB (104 instances)
     L3 cache:                    210 MiB (2 instances)
     NUMA node(s):                4
     NUMA node0 CPU(s):           0-25,104-129
     NUMA node1 CPU(s):           26-51,130-155
     NUMA node2 CPU(s):           52-77,156-181
     NUMA node3 CPU(s):           78-103,182-207
     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
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
   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, 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      4.9M   12 Data             1      64        1             64
     L1i      32K      3.3M    8 Instruction      1      64        1             64
     L2        2M      208M   16 Unified          2    2048        1             64
     L3      105M      210M   15 Unified          3  114688        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: 0-25,104-129
   node 0 size: 128676 MB
   node 0 free: 128049 MB
   node 1 cpus: 26-51,130-155
   node 1 size: 128973 MB
   node 1 free: 128265 MB
   node 2 cpus: 52-77,156-181
   node 2 size: 129012 MB
   node 2 free: 128573 MB
   node 3 cpus: 78-103,182-207
   node 3 size: 128998 MB
   node 3 free: 128420 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:       528037220 kB


 -----------------------------------------------------------
 10. who -r
   run-level 3 Oct 17 03:37


 -----------------------------------------------------------
 11. Systemd service manager version: systemd 252 (252-13.el9_2)
   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
```

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## Platform Notes (Continued)

```
  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=(hd3,gpt2)/vmlinuz-5.14.0-284.11.1.el9_2.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


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


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

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## Platform Notes (Continued)

```
    ----------------------------------------------------------
    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 9.2 (Plow)
      redhat-release Red Hat Enterprise Linux release 9.2 (Plow)
      system-release Red Hat Enterprise Linux release 9.2 (Plow)

    ----------------------------------------------------------
    20. Disk information
    SPEC is set to: /home/cpu2017-1.1.9-ic2023.0-2
      Filesystem              Type  Size  Used Avail Use% Mounted on
      /dev/mapper/rhel-home xfs   819G   22G  797G   3% /home

    ----------------------------------------------------------
    21. /sys/devices/virtual/dmi/id
       Vendor:          Lenovo
       Product:         ThinkSystem SR650 V3 MB,EGS,DDR5,SH,2U
       Product Family: ThinkSystem
       Serial:          1234567890


    ----------------------------------------------------------
    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 M321R4GA3BB0-CQKEG 32 GB 2 rank 4800
        8x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800



    ----------------------------------------------------------
    23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:       Lenovo
       BIOS Version:      ESE117F-2.22
       BIOS Date:         08/29/2023
       BIOS Revision:     2.22
       Firmware Revision: 3.13
```

## Compiler Version Notes

```
==============================================================================================
C      | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
----------------------------------------------------------------------------------------------
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.
----------------------------------------------------------------------------------------------
```

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## Compiler Version Notes (Continued)

```
==============================================================================
C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)
------------------------------------------------------------------------------
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 | 648.exchange2_s(base)
------------------------------------------------------------------------------
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`

# Base Portability Flags

600.perlbench_s: `-DSPEC_LP64 -DSPEC_LINUX_X64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`
623.xalancbmk_s: `-DSPEC_LP64 -DSPEC_LINUX`
625.x264_s: `-DSPEC_LP64`
631.deepsjeng_s: `-DSPEC_LP64`
641.leela_s: `-DSPEC_LP64`
648.exchange2_s: `-DSPEC_LP64`
657.xz_s: `-DSPEC_LP64`

# Base Optimization Flags

C benchmarks:
`-m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp`

**(Continued on next page)**

## Lenovo Global Technology

ThinkSystem SR650 V3
(2.10 GHz, Intel Xeon Platinum 8470Q)

SPECspeed®2017_int_base =     14.7

SPECspeed®2017_int_peak = Not Run

| | | | |
|---|---|---|---|
| **CPU2017 License:** 9017 | | **Test Date:** | Oct-2023 |
| **Test Sponsor:** | Lenovo Global Technology | **Hardware Availability:** | May-2023 |
| **Tested by:** | Lenovo Global Technology | **Software Availability:** | May-2023 |

# Base Optimization Flags (Continued)

C benchmarks (continued):
```
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:
```
-m64 -std=c++14 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:
```
-m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

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-Eaglestream-AA.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64_revB.2023-10-11.html

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-Eaglestream-AA.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64_revB.2023-10-11.xml

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

Tested with SPEC CPU®2017 v1.1.9 on 2023-10-17 03:46:09-0400.
Report generated on 2024-01-29 18:13:56 by CPU2017 PDF formatter v6716.
Originally published on 2023-11-07.