SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

ThinkSystem SR950 V3
(2.20 GHz, Intel Xeon Platinum 8460H)

$SPECrate®2017\_int\_base =$ 2790

$SPECrate®2017\_int\_peak =$ Not Run

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

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

Copies

Benchmark	Copies	Result
500.perlbench_r	640	2130
502.gcc_r	640	2270
505.mcf_r	640	4370
520.omnetpp_r	640	1770
523.xalancbmk_r	640	3900
525.x264_r	640	5500
531.deepsjeng_r	640	2030
541.leela_r	640	2020
548.exchange2_r	640	6120
557.xz_r	640	1410

SPECrate®2017_int_base (2790)

Hardware

CPU Name: Intel Xeon Platinum 8460H
 Max MHz: 3800
 Nominal: 2200
Enabled: 320 cores, 8 chips, 2 threads/core
Orderable: 8 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: 4 TB (64 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 480 GB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP5
 Kernel 5.14.21-150500.53-default
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 EBE103M 1.10 released Oct-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

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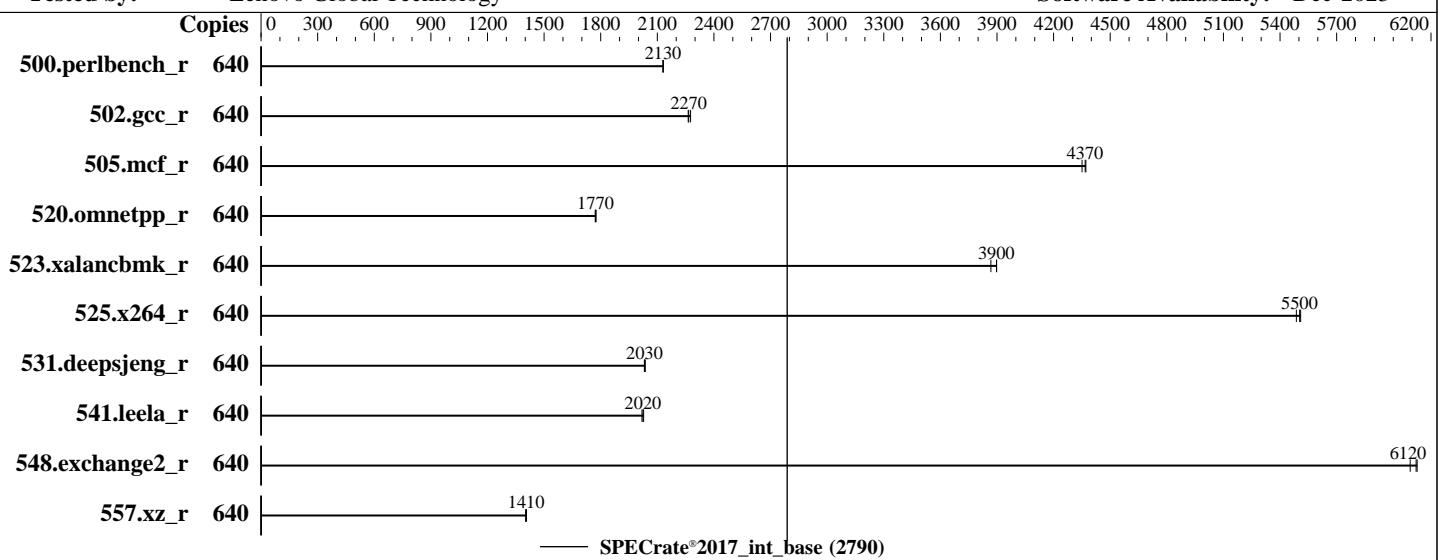
SPECrate®2017_int_peak = Not Run

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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	640	478	2130	478	2130	**478**	**2130**							
502.gcc_r	640	398	2280	**400**	**2270**	400	2260							
505.mcf_r	640	**237**	**4370**	238	4350	237	4370							
520.omnetpp_r	640	474	1770	**474**	**1770**	473	1780							
523.xalancbmk_r	640	173	3900	175	3870	**173**	**3900**							
525.x264_r	640	**204**	**5500**	203	5510	204	5490							
531.deepsjeng_r	640	**361**	**2030**	361	2030	360	2040							
541.leela_r	640	**524**	**2020**	523	2030	525	2020							
548.exchange2_r	640	274	6130	**274**	**6120**	275	6090							
557.xz_r	640	491	1410	493	1400	**492**	**1410**							
SPECrate®2017_int_base =		**2790**												
SPECrate®2017_int_peak =		**Not Run**												

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

Submit Notes

```
   The numactl mechanism was used to bind copies to processors. The config file option 'submit'
   was used to generate numactl commands to bind each copy to a specific processor.
   For details, please see the config file.
```

Operating System Notes

```
   Stack size set to unlimited using "ulimit -s unlimited"
```

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
   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.
```

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General Notes (Continued)

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.

Platform Notes

```
BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-States set to Legacy
SNC set to SNC4
LLC Prefetch 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 Wed Dec 13 20:44:50 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 249 (249.16+suse.171.gdad0071f15)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 --------------------------------------------------------------

 --------------------------------------------------------------
 1. uname -a
   Linux localhost 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
   x86_64 x86_64 x86_64 GNU/Linux

 --------------------------------------------------------------
 2. w
    20:44:50 up 3 min,  1 user,  load average: 0.04, 0.11, 0.06
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                20:42   10.00s  1.08s  0.01s /bin/bash ./speccpu_rock.sh

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

(Continued on next page)

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Platform Notes (Continued)

```
          ----------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority          (-e) 0
  file size               (blocks, -f) unlimited
  pending signals              (-i) 16511674
  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) 16511674
  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
 /bin/bash ./speccpu_rock.sh
 /bin/bash ./speccpu_rock.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=640 -c
   ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=320 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base -o all intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=640 --configfile
   ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=320 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
   rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.177/templogs/preenv.intrate.177.0.log --lognum 177.0 --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) Platinum 8460H
    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       : 40
    siblings        : 80
    8 physical ids (chips)
    640 processors (hardware threads)
    physical id 0: core ids 0-39
    physical id 1: core ids 0-39
    physical id 2: core ids 0-39
    physical id 3: core ids 0-39
    physical id 4: core ids 0-39
    physical id 5: core ids 0-39
    physical id 6: core ids 0-39
    physical id 7: core ids 0-39
    physical id 0: apicids 0-79
    physical id 1: apicids 128-207
```

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Platform Notes (Continued)

```
      physical id 2: apicids 256-335
      physical id 3: apicids 384-463
      physical id 4: apicids 512-591
      physical id 5: apicids 640-719
      physical id 6: apicids 768-847
      physical id 7: apicids 896-975
   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):                    640
     On-line CPU(s) list:       0-639
     Vendor ID:                 GenuineIntel
     Model name:                Intel(R) Xeon(R) Platinum 8460H
     CPU family:                6
     Model:                     143
     Thread(s) per core:        2
     Core(s) per socket:        40
     Socket(s):                 8
     Stepping:                  8
     CPU max MHz:               3800.0000
     CPU min MHz:               800.0000
     BogoMIPS:                  4400.00
     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 hle
                                avx2 smep bmi2 erms invpcid rtm 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 avx512_fp16 amx_tile flush_l1d arch_capabilities
     Virtualization:            VT-x
     L1d cache:                 15 MiB (320 instances)
     L1i cache:                 10 MiB (320 instances)
     L2 cache:                  640 MiB (320 instances)
     L3 cache:                  840 MiB (8 instances)
     NUMA node(s):              32
     NUMA node0 CPU(s):         0-9,320-329
     NUMA node1 CPU(s):         10-19,330-339
     NUMA node2 CPU(s):         20-29,340-349
     NUMA node3 CPU(s):         30-39,350-359
     NUMA node4 CPU(s):         40-49,360-369
     NUMA node5 CPU(s):         50-59,370-379
     NUMA node6 CPU(s):         60-69,380-389
```

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Platform Notes (Continued)

```
  NUMA node7 CPU(s):            70-79,390-399
  NUMA node8 CPU(s):            80-89,400-409
  NUMA node9 CPU(s):            90-99,410-419
  NUMA node10 CPU(s):           100-109,420-429
  NUMA node11 CPU(s):           110-119,430-439
  NUMA node12 CPU(s):           120-129,440-449
  NUMA node13 CPU(s):           130-139,450-459
  NUMA node14 CPU(s):           140-149,460-469
  NUMA node15 CPU(s):           150-159,470-479
  NUMA node16 CPU(s):           160-169,480-489
  NUMA node17 CPU(s):           170-179,490-499
  NUMA node18 CPU(s):           180-189,500-509
  NUMA node19 CPU(s):           190-199,510-519
  NUMA node20 CPU(s):           200-209,520-529
  NUMA node21 CPU(s):           210-219,530-539
  NUMA node22 CPU(s):           220-229,540-549
  NUMA node23 CPU(s):           230-239,550-559
  NUMA node24 CPU(s):           240-249,560-569
  NUMA node25 CPU(s):           250-259,570-579
  NUMA node26 CPU(s):           260-269,580-589
  NUMA node27 CPU(s):           270-279,590-599
  NUMA node28 CPU(s):           280-289,600-609
  NUMA node29 CPU(s):           290-299,610-619
  NUMA node30 CPU(s):           300-309,620-629
  NUMA node31 CPU(s):           310-319,630-639
  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 and seccomp
  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      15M   12 Data            1     64        1            64
      L1i       32K      10M    8 Instruction     1     64        1            64
      L2         2M     640M   16 Unified         2   2048        1            64
      L3       105M     840M   15 Unified         3 114688        1            64

    -------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 32 nodes (0-31)
  node 0 cpus: 0-9,320-329
  node 0 size: 128547 MB
  node 0 free: 127842 MB
  node 1 cpus: 10-19,330-339
  node 1 size: 129018 MB
  node 1 free: 128498 MB
  node 2 cpus: 20-29,340-349
  node 2 size: 129018 MB
  node 2 free: 128559 MB
  node 3 cpus: 30-39,350-359
  node 3 size: 129018 MB
```

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Platform Notes (Continued)

```
      node 3 free: 128609 MB
      node 4 cpus: 40-49,360-369
      node 4 size: 129018 MB
      node 4 free: 128776 MB
      node 5 cpus: 50-59,370-379
      node 5 size: 129018 MB
      node 5 free: 128821 MB
      node 6 cpus: 60-69,380-389
      node 6 size: 129018 MB
      node 6 free: 128783 MB
      node 7 cpus: 70-79,390-399
      node 7 size: 129018 MB
      node 7 free: 128725 MB
      node 8 cpus: 80-89,400-409
      node 8 size: 129018 MB
      node 8 free: 128718 MB
      node 9 cpus: 90-99,410-419
      node 9 size: 129018 MB
      node 9 free: 128832 MB
      node 10 cpus: 100-109,420-429
      node 10 size: 129018 MB
      node 10 free: 128881 MB
      node 11 cpus: 110-119,430-439
      node 11 size: 129018 MB
      node 11 free: 128743 MB
      node 12 cpus: 120-129,440-449
      node 12 size: 129018 MB
      node 12 free: 128465 MB
      node 13 cpus: 130-139,450-459
      node 13 size: 129018 MB
      node 13 free: 128640 MB
      node 14 cpus: 140-149,460-469
      node 14 size: 128984 MB
      node 14 free: 128606 MB
      node 15 cpus: 150-159,470-479
      node 15 size: 129018 MB
      node 15 free: 128633 MB
      node 16 cpus: 160-169,480-489
      node 16 size: 129018 MB
      node 16 free: 128592 MB
      node 17 cpus: 170-179,490-499
      node 17 size: 129018 MB
      node 17 free: 128602 MB
      node 18 cpus: 180-189,500-509
      node 18 size: 129018 MB
      node 18 free: 128622 MB
      node 19 cpus: 190-199,510-519
      node 19 size: 129018 MB
      node 19 free: 128708 MB
      node 20 cpus: 200-209,520-529
      node 20 size: 129018 MB
      node 20 free: 128327 MB
      node 21 cpus: 210-219,530-539
      node 21 size: 129018 MB
      node 21 free: 128486 MB
      node 22 cpus: 220-229,540-549
      node 22 size: 129018 MB
      node 22 free: 128531 MB
      node 23 cpus: 230-239,550-559
      node 23 size: 129018 MB
```

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Platform Notes (Continued)

```
    node 23 free: 128552 MB
    node 24 cpus: 240-249,560-569
    node 24 size: 129018 MB
    node 24 free: 128792 MB
    node 25 cpus: 250-259,570-579
    node 25 size: 129018 MB
    node 25 free: 128815 MB
    node 26 cpus: 260-269,580-589
    node 26 size: 129018 MB
    node 26 free: 128824 MB
    node 27 cpus: 270-279,590-599
    node 27 size: 129018 MB
    node 27 free: 128354 MB
    node 28 cpus: 280-289,600-609
    node 28 size: 129018 MB
    node 28 free: 128597 MB
    node 29 cpus: 290-299,610-619
    node 29 size: 129018 MB
    node 29 free: 128629 MB
    node 30 cpus: 300-309,620-629
    node 30 size: 129018 MB
    node 30 free: 128664 MB
    node 31 cpus: 310-319,630-639
    node 31 size: 128871 MB
    node 31 free: 128472 MB
    node distances:
    node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
    25  26  27  28  29  30  31
      0:  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
      1:  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
      2:  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
      3:  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
      4:  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
      5:  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
      6:  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
      7:  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
      8:  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
      9:  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
     10:  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
     11:  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31
    31  31  31  21  21  21  21
     12:  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
     13:  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
     14:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
     15:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21  21
    21  21  21  31  31  31  31
```

Lenovo Global Technology

ThinkSystem SR950 V3
(2.20 GHz, Intel Xeon Platinum 8460H)

SPECrate®2017_int_base =   2790

SPECrate®2017_int_peak = Not Run

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

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
   16:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21
   21  21  21  31  31  31  31
   17:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21
   21  21  21  31  31  31  31
   18:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21
   21  21  21  31  31  31  31
   19:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21
   21  21  21  31  31  31  31
   20:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31
   31  31  31  21  21  21  21
   21:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31
   31  31  31  21  21  21  21
   22:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31
   31  31  31  21  21  21  21
   23:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31
   31  31  31  21  21  21  21
   24:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10
   12  12  12  21  21  21  21
   25:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
   10  12  12  21  21  21  21
   26:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
   12  10  12  21  21  21  21
   27:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
   12  12  10  21  21  21  21
   28:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
   21  21  21  10  12  12  12
   29:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
   21  21  21  12  10  12  12
   30:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
   21  21  21  12  12  10  12
   31:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
   21  21  21  12  12  12  10

   ------------------------------------------------------------
   9. /proc/meminfo
      MemTotal:       4227020876 kB


   ------------------------------------------------------------
   10. who -r
     run-level 3 Dec 13 20:42


   ------------------------------------------------------------
   11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
     Default Target  Status
     multi-user      running


   ------------------------------------------------------------
   12. Services, from systemctl list-unit-files
     STATE           UNIT FILES
     enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ irqbalance issue-generator
                     kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections postfix purge-kernels rollback
                     rsyslog smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
                     wickedd-nanny
     enabled-runtime systemd-remount-fs
     disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                     chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                     firewalld gpm grub2-once haveged haveged-switch-root ipmi ipmievd issue-add-ssh-keys
                     kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb nvmf-autoconnect rpcbind
                     rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts smb snmpd snmptrapd
                     systemd-boot-check-no-failures systemd-network-generator systemd-sysext
```

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Lenovo Global Technology

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CPU2017 License: 9017
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Test Date: Dec-2023
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Software Availability: Dec-2023

Platform Notes (Continued)

```
                 systemd-time-wait-sync systemd-timesyncd
  generated      ntp_sync
  indirect       wickedd


  ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
  root=UUID=b994fb3e-4843-44ed-8f13-53774aafae18
  splash=silent
  mitigations=auto
  quiet
  security=apparmor


  ----------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
     current policy: frequency should be within 800 MHz and 3.80 GHz.
                     The governor "powersave" may decide which speed to use
                     within this range.
     boost state support:
       Supported: yes
       Active: yes


  ----------------------------------------------------------
15. 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


  ----------------------------------------------------------
16.  /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


  ----------------------------------------------------------
17.  /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
```

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Lenovo Global Technology

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

Platform Notes (Continued)

```
   scan_sleep_millisecs    10000


   ----------------------------------------------------------
   18. OS release
     From /etc/*-release /etc/*-version
     os-release SUSE Linux Enterprise Server 15 SP5


   ----------------------------------------------------------
   19. Disk information
   SPEC is set to: /home/cpu2017-1.1.9-ic2023.2.3
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sdc3      xfs   445G   82G  363G  19% /


   ----------------------------------------------------------
   20. /sys/devices/virtual/dmi/id
       Vendor:         Lenovo
       Product:        ThinkSystem SR950 V3
       Product Family: ThinkSystem
       Serial:         BLRSDV044


   ----------------------------------------------------------
   21. dmidecode
     Additional information from dmidecode 3.4 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:
       41x SK Hynix HMCG94AEBRA102N 64 GB 2 rank 4800
       14x SK Hynix HMCG94AEBRA109N 64 GB 2 rank 4800
       9x SK Hynix HMCG94AEBRA123N 64 GB 2 rank 4800


   ----------------------------------------------------------
   22. BIOS
   (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:       Lenovo
       BIOS Version:      EBE103M-1.10
       BIOS Date:         10/10/2023
       BIOS Revision:     1.10
       Firmware Revision: 1.10
```

Compiler Version Notes

```
==============================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
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) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------


==============================================================================
Fortran  | 548.exchange2_r(base)
```

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Lenovo Global Technology

ThinkSystem SR950 V3
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

Compiler Version Notes (Continued)

```
----------------------------------------------------------------------------
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 -xsapphirerapids -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
```

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/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

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Lenovo Global Technology

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Base Optimization Flags (Continued)

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/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

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-ic2023p2-official-linux64.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-ic2023p2-official-linux64.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 2023-12-13 07:44:49-0500.
Report generated on 2024-01-03 17:39:58 by CPU2017 PDF formatter v6716.
Originally published on 2024-01-02.