SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

$SPECrate®2017\_fp\_base =$ 1860

$SPECrate®2017\_fp\_peak =$ Not Run

CPU2017 License: 9017	**Test Date:** Jul-2023
Test Sponsor: Lenovo Global Technology	**Hardware Availability:** Jun-2023
Tested by: Lenovo Global Technology	**Software Availability:** Dec-2022

Copies

Benchmark	Copies	Value
503.bwaves_r	240	8280
507.cactuBSSN_r	240	2140
508.namd_r	240	1430
510.parest_r	240	1270
511.povray_r	240	2160
519.lbm_r	240	648
521.wrf_r	240	1370
526.blender_r	240	1720
527.cam4_r	240	2030
538.imagick_r	240	5760
544.nab_r	240	3410
549.fotonik3d_r	240	1110
554.roms_r	240	689

SPECrate®2017_fp_base (1860)

Hardware

CPU Name: Intel Xeon Platinum 8490H
  Max MHz: 3500
  Nominal: 1900
Enabled: 240 cores, 4 chips
Orderable: 2,4 chips
Cache L1: 32 KB I + 48 KB D on chip per core
  L2: 2 MB I+D on chip per core
  L3: 112.5 MB I+D on chip per chip
  Other: None
Memory: 1 TB (32 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 480GB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4 (x86_64)
  Kernel 5.14.21-150400.22-default
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: Lenovo BIOS Version RSE105E 1.10 released May-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

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

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 1860
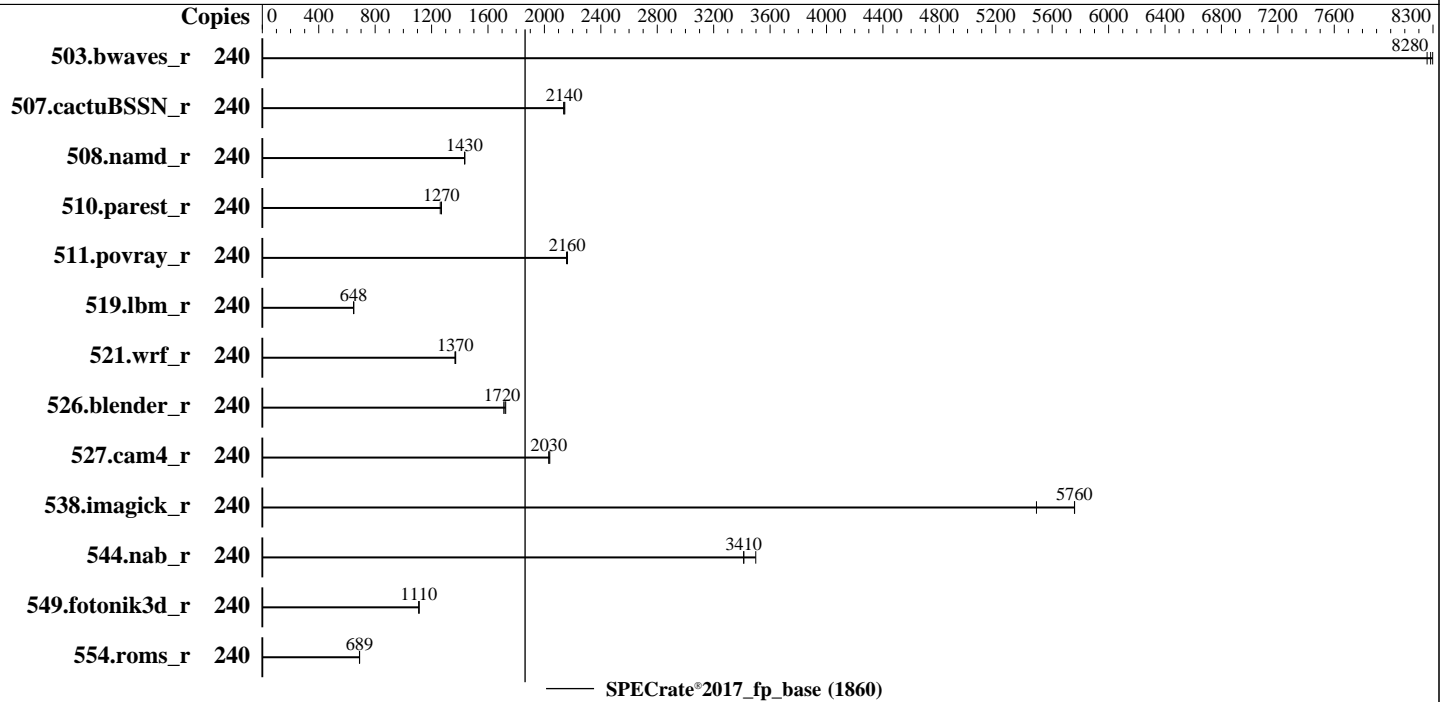
SPECrate®2017_fp_peak = Not Run

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

Test Date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	240	290	8300	**291**	**8280**	291	8260							
507.cactuBSSN_r	240	**142**	**2140**	142	2140	142	2140							
508.namd_r	240	159	1430	**159**	**1430**	159	1440							
510.parest_r	240	498	1260	494	1270	**494**	**1270**							
511.povray_r	240	260	2160	**259**	**2160**	259	2160							
519.lbm_r	240	**391**	**648**	391	648	391	647							
521.wrf_r	240	**393**	**1370**	392	1370	394	1370							
526.blender_r	240	212	1730	214	1710	**212**	**1720**							
527.cam4_r	240	207	2030	**207**	**2030**	206	2040							
538.imagick_r	240	104	5760	109	5490	**104**	**5760**							
544.nab_r	240	118	3410	**118**	**3410**	115	3500							
549.fotonik3d_r	240	**842**	**1110**	842	1110	842	1110							
554.roms_r	240	**553**	**689**	554	689	553	690							

SPECrate®2017_fp_base = 1860

SPECrate®2017_fp_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-ic2023.0/lib/intel64:/home/cpu2017-1.1.9-ic2023.0/je5.0.1-64"
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.
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 1860

SPECrate®2017_fp_peak = Not Run

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

Test Date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

General Notes (Continued)

```
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:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
Hyper-Threading set to Disabled
CPU P-state Control set to Autonomous
LLC Prefetch set to Disabled
SNC set to SNC4

 Sysinfo program /home/cpu2017-1.1.9-ic2023.0/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Sun Jul 23 10:59:02 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 (249.11+suse.124.g2bc0b2c447)
 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 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
   x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
   10:59:02 up  1:14,  1 user,  load average: 17.45, 141.20, 198.58
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
```

(Continued on next page)

Lenovo Global Technology

(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jul-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022

Platform Notes (Continued)

```
   root     tty1         -                09:45   13.00s  1.51s  0.07s -bash


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


  ----------------------------------------------------------
 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) 4126742
   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) 4126742
   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
   -bash
   -bash
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=240 -c
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=240 --define physicalfirst --define
    invoke_with_interleave --define drop_caches --tune base -o all fprate
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=240 --configfile
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=240 --define physicalfirst --define
    invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode rate
    --tune base --size refrate fprate --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.048/templogs/preenv.fprate.048.0.log --lognum 048.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017-1.1.9-ic2023.0


  ----------------------------------------------------------
 6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) Platinum 8490H
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b0001b0
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores       : 60
    siblings        : 60
    4 physical ids (chips)
    240 processors (hardware threads)
    physical id 0: core ids 0-59
    physical id 1: core ids 0-59
    physical id 2: core ids 0-59
    physical id 3: core ids 0-59
```

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jul-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022

Platform Notes (Continued)

```
      physical id 0: apicids
      0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72
      ,74,76,78,80,82,84,86,88,90,92,94,96,98,100,102,104,106,108,110,112,114,116,118
      physical id 1: apicids
      128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
      80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222,224,226,228,230,23
      2,234,236,238,240,242,244,246
      physical id 2: apicids
      256,258,260,262,264,266,268,270,272,274,276,278,280,282,284,286,288,290,292,294,296,298,300,302,304,306,3
      08,310,312,314,316,318,320,322,324,326,328,330,332,334,336,338,340,342,344,346,348,350,352,354,356,358,36
      0,362,364,366,368,370,372,374
      physical id 3: apicids
      384,386,388,390,392,394,396,398,400,402,404,406,408,410,412,414,416,418,420,422,424,426,428,430,432,434,4
      36,438,440,442,444,446,448,450,452,454,456,458,460,462,464,466,468,470,472,474,476,478,480,482,484,486,48
      8,490,492,494,496,498,500,502
  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 2.37.2:
    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):                   240
    On-line CPU(s) list:      0-239
    Vendor ID:                GenuineIntel
    Model name:               Intel(R) Xeon(R) Platinum 8490H
    CPU family:               6
    Model:                    143
    Thread(s) per core:       1
    Core(s) per socket:       60
    Socket(s):                4
    Stepping:                 8
    BogoMIPS:                 3800.00
    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 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:                11.3 MiB (240 instances)
    L1i cache:                7.5 MiB (240 instances)
    L2 cache:                 480 MiB (240 instances)
    L3 cache:                 450 MiB (4 instances)
    NUMA node(s):             16
```

(Continued on next page)

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

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017		**Test Date:**	Jul-2023
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Jun-2023
Tested by:	Lenovo Global Technology	**Software Availability:**	Dec-2022

Platform Notes (Continued)

```
  NUMA node0 CPU(s):            0-14
  NUMA node1 CPU(s):            15-29
  NUMA node2 CPU(s):            30-44
  NUMA node3 CPU(s):            45-59
  NUMA node4 CPU(s):            60-74
  NUMA node5 CPU(s):            75-89
  NUMA node6 CPU(s):            90-104
  NUMA node7 CPU(s):            105-119
  NUMA node8 CPU(s):            120-134
  NUMA node9 CPU(s):            135-149
  NUMA node10 CPU(s):           150-164
  NUMA node11 CPU(s):           165-179
  NUMA node12 CPU(s):           180-194
  NUMA node13 CPU(s):           195-209
  NUMA node14 CPU(s):           210-224
  NUMA node15 CPU(s):           225-239
  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 and seccomp
  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    11.3M   12 Data            1      64       1              64
      L1i       32K     7.5M    8 Instruction     1      64       1              64
      L2         2M     480M   16 Unified         2    2048       1              64
      L3     112.5M     450M   15 Unified         3  122880       1              64

  ----------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 16 nodes (0-15)
  node 0 cpus: 0-14
  node 0 size: 64169 MB
  node 0 free: 62928 MB
  node 1 cpus: 15-29
  node 1 size: 64508 MB
  node 1 free: 63802 MB
  node 2 cpus: 30-44
  node 2 size: 64508 MB
  node 2 free: 63856 MB
  node 3 cpus: 45-59
  node 3 size: 64508 MB
  node 3 free: 63864 MB
  node 4 cpus: 60-74
  node 4 size: 64508 MB
  node 4 free: 63916 MB
  node 5 cpus: 75-89
  node 5 size: 64508 MB
  node 5 free: 63894 MB
  node 6 cpus: 90-104
  node 6 size: 64508 MB
  node 6 free: 63890 MB
  node 7 cpus: 105-119
  node 7 size: 64508 MB
```

(Continued on next page)

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jul-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022

Platform Notes (Continued)

```
   node 7 free: 63900 MB
   node 8 cpus: 120-134
   node 8 size: 64508 MB
   node 8 free: 63898 MB
   node 9 cpus: 135-149
   node 9 size: 64508 MB
   node 9 free: 63878 MB
   node 10 cpus: 150-164
   node 10 size: 64508 MB
   node 10 free: 63883 MB
   node 11 cpus: 165-179
   node 11 size: 64508 MB
   node 11 free: 63879 MB
   node 12 cpus: 180-194
   node 12 size: 64508 MB
   node 12 free: 63880 MB
   node 13 cpus: 195-209
   node 13 size: 64508 MB
   node 13 free: 63889 MB
   node 14 cpus: 210-224
   node 14 size: 64508 MB
   node 14 free: 63892 MB
   node 15 cpus: 225-239
   node 15 size: 64426 MB
   node 15 free: 63801 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
     0:  10  12  12  12  21  21  21  21  21  21  21  21  21  21  21  21
     1:  12  10  12  12  21  21  21  21  21  21  21  21  21  21  21  21
     2:  12  12  10  12  21  21  21  21  21  21  21  21  21  21  21  21
     3:  12  12  12  10  21  21  21  21  21  21  21  21  21  21  21  21
     4:  21  21  21  21  10  12  12  12  21  21  21  21  21  21  21  21
     5:  21  21  21  21  12  10  12  12  21  21  21  21  21  21  21  21
     6:  21  21  21  21  12  12  10  12  21  21  21  21  21  21  21  21
     7:  21  21  21  21  12  12  12  10  21  21  21  21  21  21  21  21
     8:  21  21  21  21  21  21  21  21  10  12  12  12  21  21  21  21
     9:  21  21  21  21  21  21  21  21  12  10  12  12  21  21  21  21
    10:  21  21  21  21  21  21  21  21  12  12  10  12  21  21  21  21
    11:  21  21  21  21  21  21  21  21  12  12  12  10  21  21  21  21
    12:  21  21  21  21  21  21  21  21  21  21  21  21  10  12  12  12
    13:  21  21  21  21  21  21  21  21  21  21  21  21  12  10  12  12
    14:  21  21  21  21  21  21  21  21  21  21  21  21  12  12  10  12
    15:  21  21  21  21  21  21  21  21  21  21  21  21  12  12  12  10


   ------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       1056470652 kB


   ------------------------------------------------------------
10. who -r
   run-level 3 Jul 23 09:45


   ------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
   Default Target  Status
   multi-user      running


   ------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
```

(Continued on next page)

Lenovo Global Technology

(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License:	9017	**Test Date:**	Jul-2023
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Jun-2023
Tested by:	Lenovo Global Technology	**Software Availability:**	Dec-2022

Platform Notes (Continued)

```
    enabled          YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ haveged irqbalance
                     issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog
                     smartd sshd 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-switch-root ipmi ipmievd issue-add-ssh-keys kexec-load
                     lunmask man-db-create multipathd nfs nfs-blkmap rdisc rpcbind rpmconfigcheck rsyncd
                     serial-getty@ smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures
                     systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd
    indirect         wickedd

  ----------------------------------------------------------
  13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
    root=UUID=07b494b8-a782-4eba-84f2-ef5cae789da8
    splash=silent
    mitigations=auto
    quiet
    security=apparmor

  ----------------------------------------------------------
  14. cpupower frequency-info
    analyzing CPU 0:
      Unable to determine current policy
      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
```

(Continued on next page)

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jul-2023

Hardware Availability: Jun-2023

Software Availability: Dec-2022

Platform Notes (Continued)

```
   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


  ----------------------------------------------------------
  18. OS release
    From /etc/*-release /etc/*-version
    os-release SUSE Linux Enterprise Server 15 SP4


  ----------------------------------------------------------
  19. Disk information
  SPEC is set to: /home/cpu2017-1.1.9-ic2023.0
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda3      xfs   445G   12G  433G   3% /


  ----------------------------------------------------------
  20. /sys/devices/virtual/dmi/id
      Vendor:          Lenovo
      Product:         ThinkSystem SR860 V3
      Product Family: ThinkSystem
      Serial:          None


  ----------------------------------------------------------
  21. dmidecode
    Additional information from dmidecode 3.2 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:
      19x Samsung M321R4GA3BB0-CQKDG 32 GB 2 rank 4800
       6x Samsung M321R4GA3BB0-CQKEG 32 GB 2 rank 4800
       4x Samsung M321R4GA3BB0-CQKMG 32 GB 2 rank 4800
       3x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800


  ----------------------------------------------------------
  22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:      Lenovo
      BIOS Version:     RSE105E-1.10
      BIOS Date:        05/12/2023
      BIOS Revision:    1.10
      Firmware Revision: 1.10
```

Compiler Version Notes

```
==============================================================================
C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(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.
------------------------------------------------------------------------------


==============================================================================
C++             | 508.namd_r(base) 510.parest_r(base)
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 1860

SPECrate®2017_fp_peak = Not Run

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

Test Date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------------
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++, C          | 511.povray_r(base) 526.blender_r(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.
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++, C, Fortran | 507.cactuBSSN_r(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.
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.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


================================================================================
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
--------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


================================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
--------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
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.
--------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icx
```

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

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

(Continued on next page)

Lenovo Global Technology

(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017		**Test Date:**	Jul-2023
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Jun-2023
Tested by:	Lenovo Global Technology	**Software Availability:**	Dec-2022

Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
`icpx icx`

Benchmarks using Fortran, C, and C++:
`icpx icx ifx`

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
526.blender_r: `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
527.cam4_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_r: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
```

(Continued on next page)

Lenovo Global Technology
(Test Sponsor: Lenovo Global Technology)

ThinkSystem SR860 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017		**Test Date:**	Jul-2023
Test Sponsor: Lenovo Global Technology		**Hardware Availability:**	Jun-2023
Tested by: Lenovo Global Technology		**Software Availability:**	Dec-2022

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both Fortran and C:
```
-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Eaglestream-W.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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Eaglestream-W.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 2023-07-22 22:59:02-0400.
Report generated on 2023-08-16 14:18:42 by CPU2017 PDF formatter v6716.
Originally published on 2023-08-15.