SPEC CPU®2017 Floating Point Rate Result

Lenovo Global Technology

ThinkSystem SD530 V3
(2.00 GHz, Intel Xeon Platinum 8581V)

SPECrate®2017_fp_base =   524

SPECrate®2017_fp_peak = Not Run
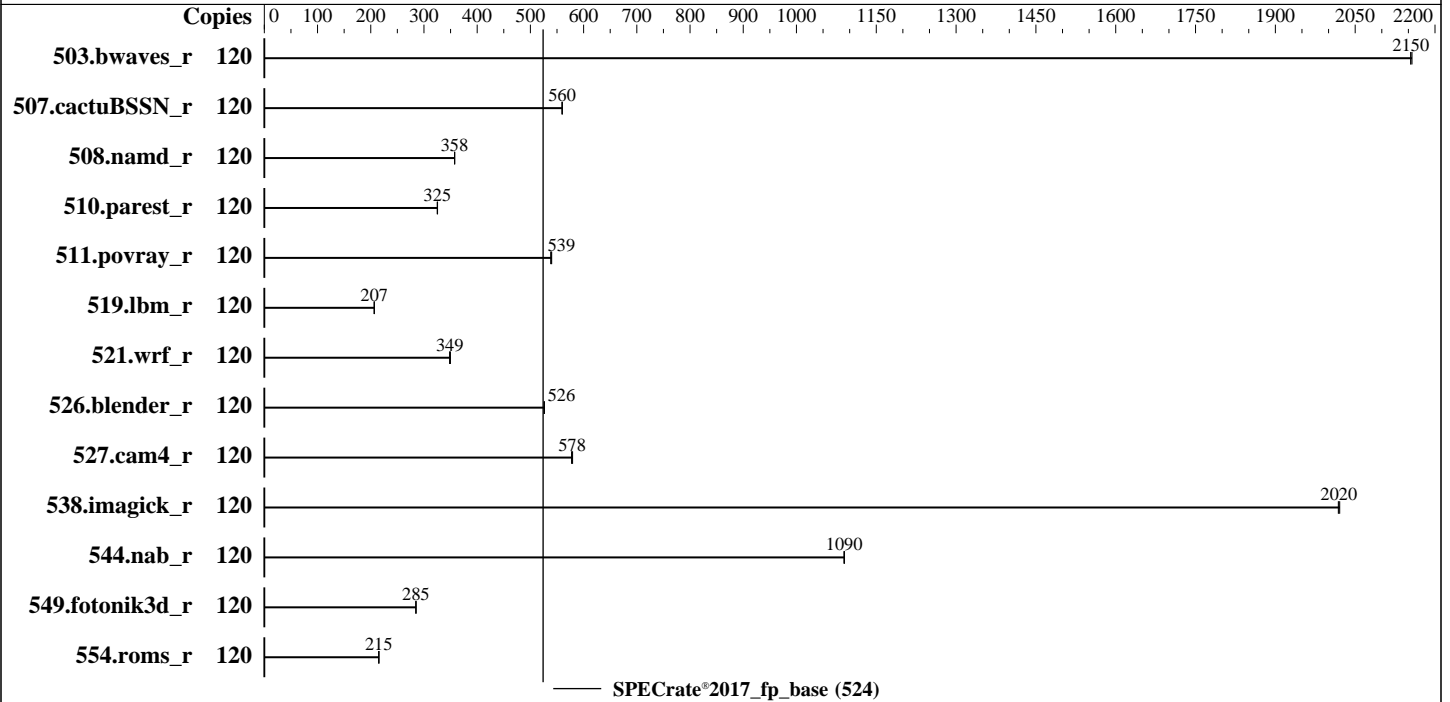
CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Apr-2024
Hardware Availability: Mar-2024
Software Availability: Mar-2024

Benchmark	Copies	Result
503.bwaves_r	120	2150
507.cactuBSSN_r	120	560
508.namd_r	120	358
510.parest_r	120	325
511.povray_r	120	539
519.lbm_r	120	207
521.wrf_r	120	349
526.blender_r	120	526
527.cam4_r	120	578
538.imagick_r	120	2020
544.nab_r	120	1090
549.fotonik3d_r	120	285
554.roms_r	120	215

Scale: 0 100 200 300 400 500 600 700 800 900 1000 1150 1300 1450 1600 1750 1900 2050 2200

SPECrate®2017_fp_base (524)

Hardware

CPU Name: Intel Xeon Platinum 8581V
 Max MHz: 3900
 Nominal: 2000
Enabled: 60 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1:   32 KB I + 48 KB D on chip per core
 L2:   2 MB I+D on chip per core
 L3:   300 MB I+D on chip per chip
 Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC5-5600B-R, running at 4800)
Storage: 1 x 480 GB M.2 SATA SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.3 (Plow)
 Kernel 5.14.0-362.8.1.el9_3.x86_64
Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Lenovo BIOS Version FNE113F 2.20 released Jan-2024
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 set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	120	559	2150	558	2160	**558**	**2150**							
507.cactuBSSN_r	120	**271**	**560**	271	560	272	559							
508.namd_r	120	319	358	319	358	**319**	**358**							
510.parest_r	120	966	325	**965**	**325**	964	326							
511.povray_r	120	**520**	**539**	521	538	519	540							
519.lbm_r	120	612	207	**612**	**207**	612	207							
521.wrf_r	120	772	348	**771**	**349**	769	350							
526.blender_r	120	347	526	348	526	**347**	**526**							
527.cam4_r	120	362	579	**363**	**578**	364	577							
538.imagick_r	120	148	2020	**148**	**2020**	148	2020							
544.nab_r	120	185	1090	185	1090	**185**	**1090**							
549.fotonik3d_r	120	1640	285	**1641**	**285**	1643	285							
554.roms_r	120	886	215	887	215	**886**	**215**							

SPECrate®2017_fp_base =	**524**
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-ic2024.0.2/lib/intel64:/home/cpu2017-1.1.9-ic2024.0.2/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)

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

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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
C-States set to Legacy
SNC set to SNC2
LLC Prefetch set to Disabled
AMP Prefetch set to Enable

 Sysinfo program /home/cpu2017-1.1.9-ic2024.0.2/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Sun Apr  7 09:36:20 2024

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

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 252 (252-18.el9)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. 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.localdomain 5.14.0-362.8.1.el9_3.x86_64 #1 SMP PREEMPT_DYNAMIC Tue Oct 3 11:12:36 EDT 2023
   x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
   09:36:20 up 0 min,  1 user,  load average: 0.44, 0.13, 0.05
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
```

(Continued on next page)

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Platform Notes (Continued)

```
   root     tty1      09:35  12.00s  0.82s  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) 2062532
    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) 2062532
    virtual memory              (kbytes, -v) unlimited
    file locks                        (-x) unlimited


  ----------------------------------------------------------
  5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 31
   login -- root
   -bash
   -bash
   -bash
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=120 -c
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=60 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base -o all fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=120 --configfile
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=60 --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/CPU2017.151/templogs/preenv.fprate.151.0.log --lognum 151.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /home/cpu2017-1.1.9-ic2024.0.2


  ----------------------------------------------------------
  6. /proc/cpuinfo
     model name        : INTEL(R) XEON(R) PLATINUM 8581V
     vendor_id         : GenuineIntel
     cpu family        : 6
     model             : 207
     stepping          : 2
     microcode         : 0x21000200
     bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
     cpu cores         : 60
     siblings          : 120
     1 physical ids (chips)
     120 processors (hardware threads)
     physical id 0: core ids 0-59
     physical id 0: apicids 0-119
    Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
```

(Continued on next page)

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Platform Notes (Continued)

```
   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):                       120
      On-line CPU(s) list:          0-119
      Vendor ID:                    GenuineIntel
      BIOS Vendor ID:               Intel(R) Corporation
      Model name:                   INTEL(R) XEON(R) PLATINUM 8581V
      BIOS Model name:              INTEL(R) XEON(R) PLATINUM 8581V
      CPU family:                   6
      Model:                        207
      Thread(s) per core:           2
      Core(s) per socket:           60
      Socket(s):                    1
      Stepping:                     2
      BogoMIPS:                     4000.00
      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 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 hfi vnmi 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:                    2.8 MiB (60 instances)
      L1i cache:                    1.9 MiB (60 instances)
      L2 cache:                     120 MiB (60 instances)
      L3 cache:                     300 MiB (1 instance)
      NUMA node(s):                 2
      NUMA node0 CPU(s):            0-29,60-89
      NUMA node1 CPU(s):            30-59,90-119
      Vulnerability Gather data sampling: Not affected
      Vulnerability Itlb multihit:  Not affected
      Vulnerability L1tf:           Not affected
      Vulnerability Mds:            Not affected
      Vulnerability Meltdown:       Not affected
      Vulnerability Mmio stale data: Not affected
      Vulnerability Retbleed:       Not affected
      Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
      Vulnerability Spectre v1:     Mitigation; usercopy/swapgs barriers and __user pointer sanitization
      Vulnerability Spectre v2:     Mitigation; Enhanced / Automatic IBRS, IBPB conditional, RSB filling,
                                    PBRSB-eIBRS SW sequence
```

(Continued on next page)

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Platform Notes (Continued)

```
  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     2.8M  12 Data             1      64       1             64
    L1i       32K     1.9M   8 Instruction      1      64       1             64
    L2         2M     120M  16 Unified          2    2048       1             64
    L3       300M     300M  20 Unified          3  245760       1             64

-----------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0-29,60-89
  node 0 size: 257644 MB
  node 0 free: 256802 MB
  node 1 cpus: 30-59,90-119
  node 1 size: 258027 MB
  node 1 free: 257296 MB
  node distances:
  node   0   1
    0:  10  12
    1:  12  10

-----------------------------------------------------------
9. /proc/meminfo
  MemTotal:       528048324 kB

-----------------------------------------------------------
10. who -r
  run-level 3 Apr 7 09:35

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

-----------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
                   dbus-broker firewalld getty@ insights-client-boot irqbalance kdump low-memory-monitor
                   mdmonitor microcode nis-domainname rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark
                   sshd sssd systemd-boot-update systemd-network-generator udisks2 upower
  enabled-runtime  systemd-remount-fs
  disabled         canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot
                   console-getty cpupower debug-shell dnf-system-upgrade kvm_stat man-db-restart-cache-update
                   nftables pesign rdisc rhcd rhsm rhsm-facts rpmdb-rebuild selinux-check-proper-disable
                   serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
  indirect         sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate
                   systemd-sysupdate-reboot

-----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=(hd0,gpt3)/boot/vmlinuz-5.14.0-362.8.1.el9_3.x86_64
  root=UUID=be3ee7bd-6dba-4efc-8d0a-4f4f123b4865
  ro
  resume=UUID=8de8c2d1-84ee-4c60-9038-a9e1ae2929c4
```

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Platform Notes (Continued)

```
----------------------------------------------------------
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
  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     Red Hat Enterprise Linux 9.3 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.3 (Plow)
  system-release Red Hat Enterprise Linux release 9.3 (Plow)


----------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017-1.1.9-ic2024.0.2
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda4      xfs   372G   35G  338G  10% /home
```

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Platform Notes (Continued)

```
     -------------------------------------------------------------
  20. /sys/devices/virtual/dmi/id
      Vendor:         Lenovo
      Product:        ThinkSystem SD530 V3
      Product Family: ThinkSystem
      Serial:         PASDVMK006


     -------------------------------------------------------------
  21. dmidecode
    Additional information from dmidecode 3.5 follows.  WARNING: Use caution when you interpret this section.
    The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
    determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
    "DMTF SMBIOS" standard.
    Memory:
      7x Samsung M321R8GA0PB0-CWMKH 64 GB 2 rank 5600, configured at 4800
      1x Samsung M321R8GA0PB0-CWMXH 64 GB 2 rank 5600, configured at 4800


     -------------------------------------------------------------
  22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:      Lenovo
      BIOS Version:     FNE113F-2.20
      BIOS Date:        01/02/2024
      BIOS Revision:    2.20
      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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
C++            | 508.namd_r(base) 510.parest_r(base)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
```

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Compiler Version Notes (Continued)

```
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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`

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`

(Continued on next page)

Lenovo Global Technology

ThinkSystem SD530 V3
(2.00 GHz, Intel Xeon Platinum 8581V)

SPECrate®2017_fp_base =   524

SPECrate®2017_fp_peak = Not Run

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

Test Date: Apr-2024
Hardware Availability: Mar-2024
Software Availability: Mar-2024

Base Portability Flags (Continued)

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
-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

(Continued on next page)

Lenovo Global Technology

ThinkSystem SD530 V3
(2.00 GHz, Intel Xeon Platinum 8581V)

SPECrate®2017_fp_base =   524

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Apr-2024

Hardware Availability: Mar-2024

Software Availability: Mar-2024

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```
-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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Eaglestream-AA.html
http://www.spec.org/cpu2017/flags/Intel-ic2024-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-ic2024-official-linux64.xml

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

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