SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge T360 (Intel Xeon E-2478)

$SPECrate^{®}2017\_fp\_base = 105$

$SPECrate^{®}2017\_fp\_peak = 105$

CPU2017 License: 6573   **Test Date:** Oct-2023
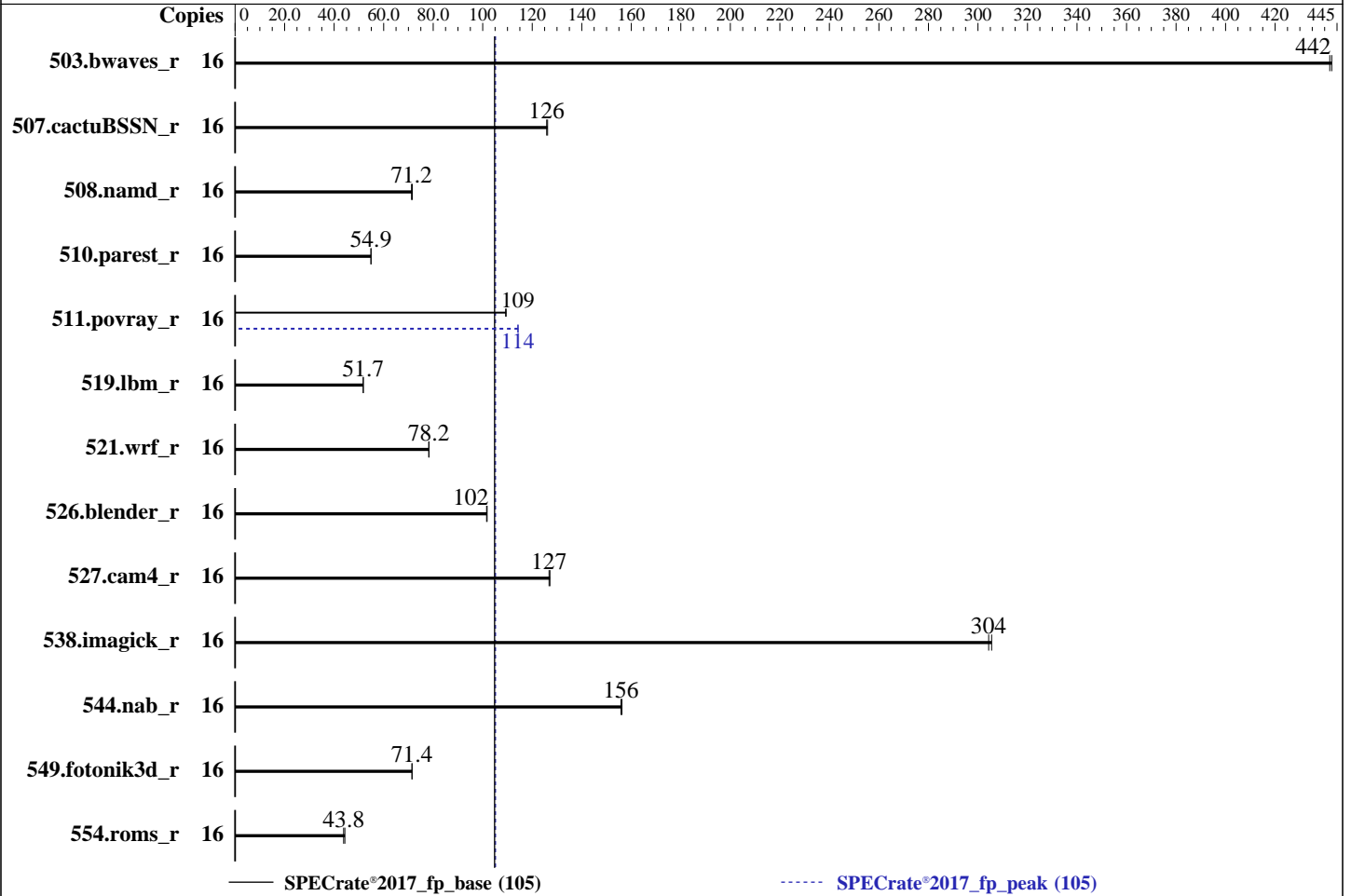**Test Sponsor:** Dell Inc.   **Hardware Availability:** Oct-2023
Tested by: Dell Inc.   **Software Availability:** Jul-2023

Copies	Value
503.bwaves_r	16	442
507.cactuBSSN_r	16	126
508.namd_r	16	71.2
510.parest_r	16	54.9
511.povray_r	16	109 / 114
519.lbm_r	16	51.7
521.wrf_r	16	78.2
526.blender_r	16	102
527.cam4_r	16	127
538.imagick_r	16	304
544.nab_r	16	156
549.fotonik3d_r	16	71.4
554.roms_r	16	43.8

SPECrate®2017_fp_base (105)   SPECrate®2017_fp_peak (105)

Hardware

CPU Name: Intel Xeon E-2478
 Max MHz: 5200
 Nominal: 2800
Enabled: 8 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: 24 MB I+D on chip per chip
 Other: None
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-4800B-E, running at 4400)
Storage: 125 GB on tmpfs
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP5
 5.14.21-150500.53-default
Compiler: C/C++: Version 2023.2 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.2 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 1.0.0 released Oct-2023
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	16	**363**	**442**	362	443			16	**363**	**442**	362	443		
507.cactuBSSN_r	16	161	126	**161**	**126**			16	161	126	**161**	**126**		
508.namd_r	16	**213**	**71.2**	212	71.6			16	**213**	**71.2**	212	71.6		
510.parest_r	16	**763**	**54.9**	762	54.9			16	**763**	**54.9**	762	54.9		
511.povray_r	16	**342**	**109**	341	109			16	**327**	**114**	327	114		
519.lbm_r	16	**326**	**51.7**	326	51.8			16	**326**	**51.7**	326	51.8		
521.wrf_r	16	**458**	**78.2**	458	78.3			16	**458**	**78.2**	458	78.3		
526.blender_r	16	239	102	**240**	**102**			16	239	102	**240**	**102**		
527.cam4_r	16	220	127	**221**	**127**			16	220	127	**221**	**127**		
538.imagick_r	16	**131**	**304**	130	306			16	**131**	**304**	130	306		
544.nab_r	16	172	156	**173**	**156**			16	172	156	**173**	**156**		
549.fotonik3d_r	16	873	71.5	**873**	**71.4**			16	873	71.5	**873**	**71.4**		
554.roms_r	16	**580**	**43.8**	574	44.3			16	**580**	**43.8**	574	44.3		
SPECrate®2017_fp_base =	**105**													
SPECrate®2017_fp_peak =	**105**													

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

Submit Notes

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

Operating System Notes

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

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/mnt/ramdisk/cpu2017-1.1.9-ic2023.x/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2023.x/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
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

(Continued on next page)

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General Notes (Continued)

```
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.

Benchmark run from a 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"
```

Platform Notes

```
BIOS settings:
       DIMM Self Healing on
    Uncorrectable Memory Error : Disabled

    Virtualization Technology : Disabled
               LLC Prefetch : Disabled
        Dead Line LLC Alloc : Disabled

              System Profile : Custom
        CPU Power Management : Maximum Performance
                        C1E : Disabled
                   C States : Autonomous
          PCI ASPM L1 Link
            Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2023.x/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Thu Oct 26 18:08:47 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
```

(Continued on next page)

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Platform Notes (Continued)

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

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

         ----------------------------------------------------------
         2. w
            18:08:47 up  7:38,  4 users,  load average: 13.54, 15.51, 15.84
           USER     TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
           root     tty1       -                10:30    3:14m  1.01s  0.00s /bin/bash ./dell-run-speccpu.sh rate
           --define DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8.1
           --output_format html,pdf,txt
           root     tty2       -                16:09    1:56m  0.03s  0.03s -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) 256444
           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) 256444
           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 ./DELL_rate.sh
          /bin/bash ./dell-run-main.sh rate
          /bin/bash ./dell-run-main.sh rate
          /bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1
            --define DL-VERS=v4.8.1 --output_format html,pdf,txt
          /bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1
            --define DL-VERS=v4.8.1 --output_format html,pdf,txt
          runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
            ic2023.2-lin-core-avx2-rate-20230622.cfg --define smt-on --define cores=8 --define physicallogical
            --define no-numa --tune base,peak -o all --define drop_caches --define DL-LQC=1 --iterations 2 --define
            DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8.1 --output_format
            html,pdf,txt fprate
          runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
            ic2023.2-lin-core-avx2-rate-20230622.cfg --define smt-on --define cores=8 --define physicallogical
            --define no-numa --tune base,peak --output_format all --define drop_caches --define DL-LQC=1 --iterations
            2 --define DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8.1
```

(Continued on next page)

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Platform Notes (Continued)

```
    --output_format html,pdf,txt --nopower --runmode rate --tune base:peak --size refrate fprate --nopreenv
    --note-preenv --logfile $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0
    --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2023.x


 ----------------------------------------------------------
 6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) E E-2478
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 183
    stepping        : 1
    microcode       : 0x11f
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores       : 8
    siblings        : 16
    1 physical ids (chips)
    16 processors (hardware threads)
    physical id 0: core ids 0-7
    physical id 0: apicids 0-15
 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:           42 bits physical, 48 bits virtual
   Byte Order:              Little Endian
   CPU(s):                  16
   On-line CPU(s) list:     0-15
   Vendor ID:               GenuineIntel
   Model name:              Intel(R) Xeon(R) E E-2478
   CPU family:              6
   Model:                   183
   Thread(s) per core:      2
   Core(s) per socket:      8
   Socket(s):               1
   Stepping:                1
   BogoMIPS:                5606.40
   Flags:                   fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                            clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                            lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                            nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                            ds_cpl smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic
                            movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm
                            3dnowprefetch cpuid_fault invpcid_single ssbd ibrs ibpb stibp
                            ibrs_enhanced fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed
                            adx smap clflushopt clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsaves
                            split_lock_detect avx_vnni dtherm ida arat pln pts hfi umip pku ospke
                            waitpkg gfni vaes vpclmulqdq tme rdpid movdiri movdir64b fsrm md_clear
                            serialize pconfig arch_lbr flush_l1d arch_capabilities
   L1d cache:               384 KiB (8 instances)
   L1i cache:               256 KiB (8 instances)
   L2 cache:                16 MiB (8 instances)
   L3 cache:                24 MiB (1 instance)
   NUMA node(s):            1
```

(Continued on next page)

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Platform Notes (Continued)

```
  NUMA node0 CPU(s):            0-15
  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     384K   12 Data            1    64     1            64
      L1i      32K     256K    8 Instruction     1    64     1            64
      L2        2M      16M   16 Unified         2  2048     1            64
      L3       24M      24M   12 Unified         3 32768     1            64

  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0-15
    node 0 size: 64142 MB
    node 0 free: 39374 MB
    node distances:
    node   0
      0:  10

  ------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       65682076 kB

  ------------------------------------------------------------
  10. who -r
    run-level 3 Oct 26 14:54 last=5

  ------------------------------------------------------------
  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         ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
                    bluetooth cron display-manager 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
                    wpa_supplicant
    enabled-runtime systemd-remount-fs
    disabled        NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofs
                    autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
                    chrony-wait chronyd console-getty cups cups-browsed debug-shell dmraid-activation dnsmasq
                    ebtables exchange-bmc-os-info firewalld gpm grub2-once haveged haveged-switch-root
                    hwloc-dump-hwdata ipmi ipmievd irqbindall issue-add-ssh-keys kexec-load ksm kvm_stat
                    lunmask man-db-create multipathd nfs nfs-blkmap nmb nvmf-autoconnect openvpn@
```

(Continued on next page)

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Platform Notes (Continued)

```
                    ostree-remount rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@ set_kthread_prio
                    smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
                    systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2
                    update-system-flatpaks upower vncserver@ wpa_supplicant@
  indirect          pcscd saned@ wickedd

    ----------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
    root=UUID=7cce9826-f9c8-4e3e-ae1d-30b9670708ae
    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                0
    kernel.randomize_va_space            2
    vm.compaction_proactiveness         20
    vm.dirty_background_bytes            0
    vm.dirty_background_ratio           10
    vm.dirty_bytes                       0
    vm.dirty_expire_centisecs         3000
    vm.dirty_ratio                      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
```

(Continued on next page)

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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: /mnt/ramdisk/cpu2017-1.1.9-ic2023.x
     Filesystem      Type   Size  Used Avail Use% Mounted on
     tmpfs           tmpfs  125G  5.4G  120G   5% /mnt/ramdisk


   -------------------------------------------------------------
   20. /sys/devices/virtual/dmi/id
       Vendor:          Dell Inc.
       Product:         PowerEdge T360
       Product Family:  PowerEdge
       Serial:          1234567


   -------------------------------------------------------------
   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:
       2x 00CE00001201 M324R4GA3BB0-CQKOD 32 GB 2 rank 4800, configured at 4400



   -------------------------------------------------------------
   22. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:      Dell Inc.
     BIOS Version:     1.0.0
     BIOS Date:        10/13/2023
     BIOS Revision:    1.0
```

Compiler Version Notes

```
==============================================================================================================
C                 | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++               | 508.namd_r(base, peak) 510.parest_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++, C            | 511.povray_r(base, peak) 526.blender_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
```

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Compiler Version Notes (Continued)

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


==============================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
-------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------------------------------


==============================================================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
-------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------------------------------


==============================================================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
-------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
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-------------------------------------------------------------------------------------------------------------
```

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
```

SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

PowerEdge T360 (Intel Xeon E-2478)

$SPECrate^{®}2017\_fp\_base = 105$

$SPECrate^{®}2017\_fp\_peak = 105$

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

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 -xCORE-AVX2 -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

C++ benchmarks:
`-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

Fortran benchmarks:
`-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -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 -xCORE-AVX2 -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-Wno-implicit-int -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 -xCORE-AVX2 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

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Standard Performance Evaluation Corporation (info@spec.org)

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SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

PowerEdge T360 (Intel Xeon E-2478)

SPECrate®2017_fp_base = 105

SPECrate®2017_fp_peak = 105

CPU2017 License: 6573
Test Sponsor: Dell Inc.
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Test Date: Oct-2023
Hardware Availability: Oct-2023
Software Availability: Jul-2023

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Peak 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
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

519.lbm_r: `basepeak = yes`

538.imagick_r: `basepeak = yes`

544.nab_r: `basepeak = yes`

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Dell Inc.

PowerEdge T360 (Intel Xeon E-2478)

SPECrate®2017_fp_base = 105

SPECrate®2017_fp_peak = 105

CPU2017 License: 6573
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Hardware Availability: Oct-2023
Software Availability: Jul-2023

Peak Optimization Flags (Continued)

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `basepeak = yes`

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `basepeak = yes`

Benchmarks using both Fortran and C:

521.wrf_r: `basepeak = yes`

527.cam4_r: `basepeak = yes`

Benchmarks using both C and C++:

511.povray_r: `-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs`
`-fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX2 -flto`
`-Ofast -ffast-math -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: `basepeak = yes`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.xml

SPEC CPU®2017 Floating Point Rate Result

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CPU2017 License: 6573

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Test Date: Oct-2023

Hardware Availability: Oct-2023

Software Availability: Jul-2023

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

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