SPEC CPU®2017 Floating Point Rate Result

Dell Inc.

$SPECrate^{®}2017\_fp\_base = 110$

PowerEdge T360 (Intel Xeon E-2488)

$SPECrate^{®}2017\_fp\_peak = 110$
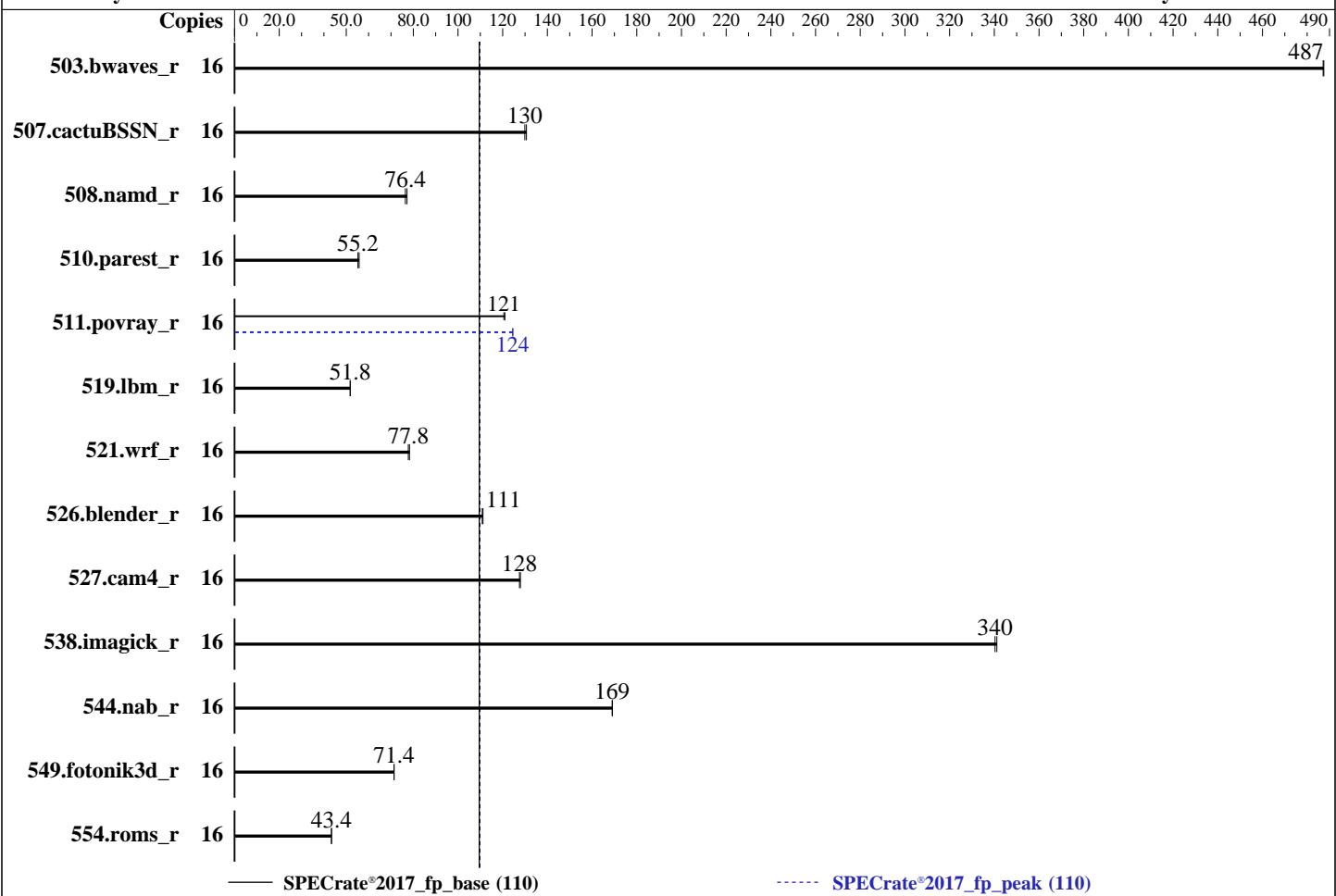
CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Oct-2023
Hardware Availability: Dec-2023
Software Availability: Dec-2022

Copies		
503.bwaves_r	16	487
507.cactuBSSN_r	16	130
508.namd_r	16	76.4
510.parest_r	16	55.2
511.povray_r	16	121 / 124
519.lbm_r	16	51.8
521.wrf_r	16	77.8
526.blender_r	16	111
527.cam4_r	16	128
538.imagick_r	16	340
544.nab_r	16	169
549.fotonik3d_r	16	71.4
554.roms_r	16	43.4

—— SPECrate®2017_fp_base (110)
- - - - SPECrate®2017_fp_peak (110)

Hardware

CPU Name: Intel Xeon E-2488
 Max MHz: 5600
 Nominal: 3200
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: 40 GB on tmpfs
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4
 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: Version 0.4.0 released Sep-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.

SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

PowerEdge T360 (Intel Xeon E-2488)

SPECrate®2017_fp_base = 110

SPECrate®2017_fp_peak = 110

CPU2017 License: 6573	**Test Date:**	Oct-2023
Test Sponsor: Dell Inc.	**Hardware Availability:**	Dec-2023
Tested by: Dell Inc.	**Software Availability:**	Dec-2022

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	16	**329**	**487**	329	487			16	**329**	**487**	329	487		
507.cactuBSSN_r	16	**156**	**130**	155	131			16	**156**	**130**	155	131		
508.namd_r	16	**199**	**76.4**	197	77.2			16	**199**	**76.4**	197	77.2		
510.parest_r	16	**758**	**55.2**	751	55.8			16	**758**	**55.2**	751	55.8		
511.povray_r	16	309	121	**310**	**121**			16	300	125	**300**	**124**		
519.lbm_r	16	**326**	**51.8**	326	51.8			16	**326**	**51.8**	326	51.8		
521.wrf_r	16	**461**	**77.8**	458	78.3			16	**461**	**77.8**	458	78.3		
526.blender_r	16	**220**	**111**	219	111			16	**220**	**111**	219	111		
527.cam4_r	16	219	128	**219**	**128**			16	219	128	**219**	**128**		
538.imagick_r	16	**117**	**340**	117	341			16	**117**	**340**	117	341		
544.nab_r	16	159	169	**159**	**169**			16	159	169	**159**	**169**		
549.fotonik3d_r	16	**874**	**71.4**	873	71.4			16	**874**	**71.4**	873	71.4		
554.roms_r	16	586	43.4	**586**	**43.4**			16	586	43.4	**586**	**43.4**		

SPECrate®2017_fp_base = **110**

SPECrate®2017_fp_peak = **110**

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-ic2023.0/lib/intel64:/mnt/ramdisk/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
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 40 GB ramdisk created with the cmd: "mount -t tmpfs -o size=40G 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-ic2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Sun Oct 29 03:09:53 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
```

(Continued on next page)

Dell Inc.

PowerEdge T360 (Intel Xeon E-2488)

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SPECrate®2017_fp_peak = 110

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Platform Notes (Continued)

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

      ----------------------------------------------------------
      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
         03:09:53 up  3:05,  1 user,  load average: 7.18, 13.62, 15.19
        USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
        root     tty1     -                00:05    3:04m  1.11s  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 --output_format
        html,pdf,txt

      ----------------------------------------------------------
      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) 255234
        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) 255234
        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 --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 --output_format html,pdf,txt
       runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
         ic2023.0-lin-core-avx2-rate-20221201.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 1 --define
         DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8 --output_format
         html,pdf,txt fprate
       runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
         ic2023.0-lin-core-avx2-rate-20221201.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
         1 --define DL-BIOSinc=Dell-BIOS_Xeon-4E.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8
         --output_format html,pdf,txt --nopower --runmode rate --tune base:peak --size refrate fprate --nopreenv
```

(Continued on next page)

Dell Inc.

PowerEdge T360 (Intel Xeon E-2488)

SPECrate®2017_fp_base = 110

SPECrate®2017_fp_peak = 110

CPU2017 License: 6573　　　　　　　　　　　　　　　　**Test Date:** Oct-2023
Test Sponsor: Dell Inc.　　　　　　　　　　　　　　　**Hardware Availability:** Dec-2023
Tested by: Dell Inc.　　　　　　　　　　　　　　　　**Software Availability:** Dec-2022

Platform Notes (Continued)

```
   --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-ic2023.0

   -------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) E E-2488
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 183
    stepping        : 1
    microcode       : 0x118
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    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 2.37.2:
  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-2488
  CPU family:                6
  Model:                     183
  Thread(s) per core:        2
  Core(s) per socket:        8
  Socket(s):                 1
  Stepping:                  1
  BogoMIPS:                  6374.40
  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
                             avx_vnni dtherm ida arat pln pts 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
  NUMA node0 CPU(s):         0-15
```

(Continued on next page)

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PowerEdge T360 (Intel Xeon E-2488)

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Platform Notes (Continued)

```
  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     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: 63832 MB
  node 0 free: 54362 MB
  node distances:
  node   0
    0:  10

  -----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       65364600 kB

  -----------------------------------------------------------
10. who -r
   run-level 3 Oct 29 00:05

  -----------------------------------------------------------
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
   enabled          YaST2-Firstboot YaST2-Second-Stage apparmor auditd chronyd cron display-manager firewalld
                    getty@ haveged irqbalance issue-generator kbdsettings kdump kdump-early 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
                    console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info 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
```

(Continued on next page)

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Platform Notes (Continued)

```
    root=UUID=2927c481-4b28-4dff-91cd-49e4759e703c
    splash=silent
    mitigations=auto
    quiet
    security=apparmor
    crashkernel=230M,high
    crashkernel=72M,low


    -------------------------------------------------------------
 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
    scan_sleep_millisecs    10000


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

(Continued on next page)

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Platform Notes (Continued)

```
--------------------------------------------------------------
19. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2023.0
  Filesystem      Type   Size  Used Avail Use% Mounted on
  tmpfs           tmpfs   40G  4.2G   36G  11% /mnt/ramdisk

--------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:        Dell Inc.
    Product:       PowerEdge T360
    Product Family: PowerEdge
    Serial:        SLT3605

--------------------------------------------------------------
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:
    2x 002C00001201 MTC20C2085S1EC48BA1 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:      0.4.0
    BIOS Date:         09/15/2023
    BIOS Revision:     0.4
```

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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 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 2023.0.0 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, peak)
--------------------------------------------------------------------------------------------------
```

(Continued on next page)

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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.
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, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
------------------------------------------------------------------------------------------
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, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------------------
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`

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`

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

PowerEdge T360 (Intel Xeon E-2488)

SPECrate®2017_fp_base = 110

SPECrate®2017_fp_peak = 110

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

Test Date: Oct-2023
Hardware Availability: Dec-2023
Software Availability: Dec-2022

Base Portability Flags (Continued)

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

Benchmarks using Fortran, C, and C++:
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast

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Base Optimization Flags (Continued)

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

(Continued on next page)

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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-ic2023-official-linux64_revB.2023-10-11.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-ic2023-official-linux64_revB.2023-10-11.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.xml

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

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