SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

$SPECspeed®2017\_fp\_base = 275$

PowerEdge R660 (Intel Xeon Gold 6454S)

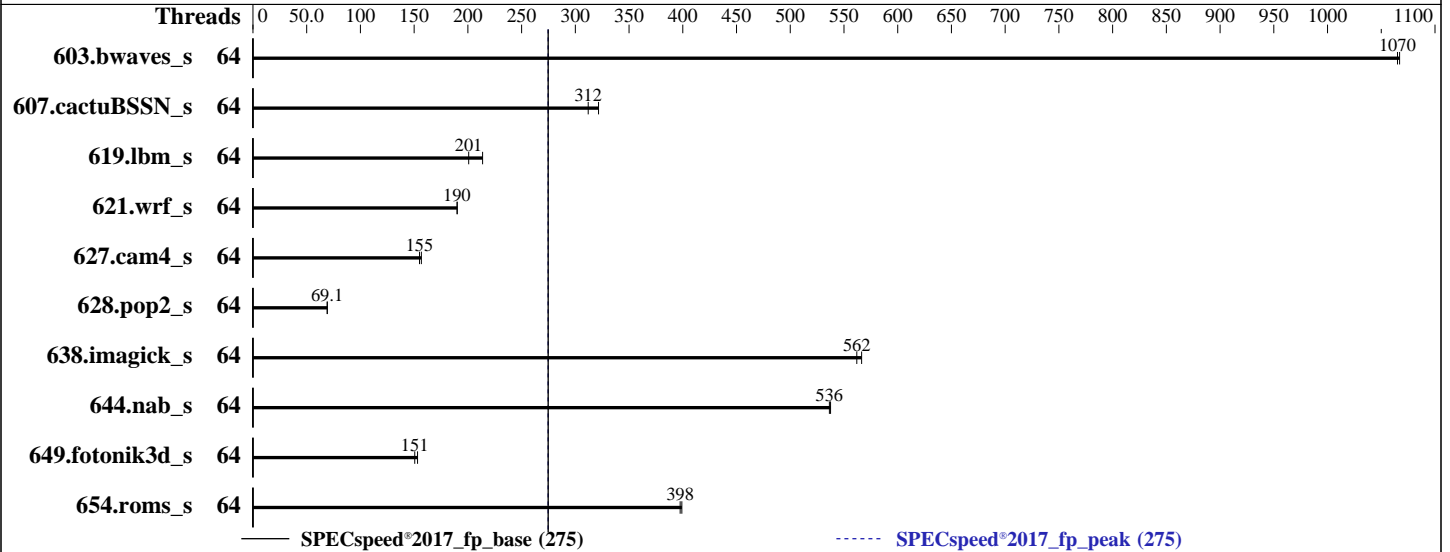$SPECspeed®2017\_fp\_peak = 275$

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

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

Threads

Benchmark	Threads	Result
603.bwaves_s	64	1070
607.cactuBSSN_s	64	312
619.lbm_s	64	201
621.wrf_s	64	190
627.cam4_s	64	155
628.pop2_s	64	69.1
638.imagick_s	64	562
644.nab_s	64	536
649.fotonik3d_s	64	151
654.roms_s	64	398

SPECspeed®2017_fp_base (275)   SPECspeed®2017_fp_peak (275)

Hardware

CPU Name: Intel Xeon Gold 6454S
  Max MHz: 3400
  Nominal: 2200
Enabled: 64 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
  L2: 2 MB I+D on chip per core
  L3: 60 MB I+D on chip per chip
  Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 125 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: Yes
Firmware: Version 1.0.1 released Dec-2022
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 Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed®2017\_fp\_base = 275$

$SPECspeed®2017\_fp\_peak = 275$

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

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

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	64	55.3	1070	**55.4**	**1070**			64	55.3	1070	**55.4**	**1070**		
607.cactuBSSN_s	64	51.8	322	**53.4**	**312**			64	51.8	322	**53.4**	**312**		
619.lbm_s	64	24.5	214	**26.1**	**201**			64	24.5	214	**26.1**	**201**		
621.wrf_s	64	69.6	190	**69.6**	**190**			64	69.6	190	**69.6**	**190**		
627.cam4_s	64	**57.2**	**155**	56.6	157			64	**57.2**	**155**	56.6	157		
628.pop2_s	64	172	69.2	**172**	**69.1**			64	172	69.2	**172**	**69.1**		
638.imagick_s	64	**25.7**	**562**	25.5	566			64	**25.7**	**562**	25.5	566		
644.nab_s	64	**32.6**	**536**	32.5	538			64	**32.6**	**536**	32.5	538		
649.fotonik3d_s	64	**60.5**	**151**	59.5	153			64	**60.5**	**151**	59.5	153		
654.roms_s	64	**39.6**	**398**	39.5	399			64	**39.6**	**398**	39.5	399		
SPECspeed®2017_fp_base =		**275**												
SPECspeed®2017_fp_peak =		**275**												

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

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:
KMP_AFFINITY = "granularity=fine,compact"
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"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Redhat Enterprise Linux 8.0
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

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 Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed®2017\_fp\_base = 275$

$SPECspeed®2017\_fp\_peak = 275$

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

Test Date: Feb-2023
Hardware Availability: Feb-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.

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

Platform Notes

```
BIOS settings:
                  ADDDC Setting : Disabled
        DIMM Self Healing on
   Uncorrectable Memory Error : Disabled
            Logical Processor : Disabled
   Virtualization Technology : Disabled
            Sub NUMA Cluster : 2-way Clustering
              Optimizer Mode : Enabled

              System Profile : Custom
       CPU Power Management : Maximum Performance
                        C1E : Disabled
                   C States : Autonomous
        Memory Patrol Scrub : Disabled
    Energy Efficiency Policy : Performance
          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 Feb 26 21:51:58 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
```

(Continued on next page)

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

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed^®2017\_fp\_base = 275$

$SPECspeed^®2017\_fp\_peak = 275$

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

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

Platform Notes (Continued)

```
   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
      21:51:58 up  2:44,  1 user,  load average: 5.90, 5.81, 3.44
      USER     TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
      root     tty1       -                19:20    2:31m  1.34s  0.00s /bin/bash ./dell-run-specspeed.sh
      --iterations 2 --output_format csv,html,pdf,txt -define Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define
      Dell-BIOS-LogProcD=1


   ------------------------------------------------------------
   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) 4126161
     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
```

(Continued on next page)

Dell Inc.

SPECspeed®2017_fp_base = 275

PowerEdge R660 (Intel Xeon Gold 6454S)

SPECspeed®2017_fp_peak = 275

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

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

Platform Notes (Continued)

```
  max user processes              (-u) 4126161
  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_speed.sh
 /bin/bash ./dell-run-main.sh speed
 /bin/bash ./dell-run-main.sh speed
 /bin/bash ./dell-run-specspeed.sh --iterations 2 --output_format csv,html,pdf,txt -define
   Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1
 /bin/bash ./dell-run-specspeed.sh --iterations 2 --output_format csv,html,pdf,txt -define
   Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1
 runcpu --nobuild --action validate --define default-platform-flags -c
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=64 --tune base,peak -o all --define
  drop_caches --iterations 2 --output_format csv,html,pdf,txt -define Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc
   --define Dell-BIOS-LogProcD=1 fpspeed
 runcpu --nobuild --action validate --define default-platform-flags --configfile
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=64 --tune base,peak --output_format all
   --define drop_caches --iterations 2 --output_format csv,html,pdf,txt --define
  Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1 --nopower --runmode speed --tune
   base:peak --size refspeed fpspeed --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fpspeed.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) Gold 6454S
    vendor_id        : GenuineIntel
    cpu family       : 6
    model            : 143
    stepping         : 8
    microcode        : 0x2b000161
    bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores        : 32
    siblings         : 32
    2 physical ids (chips)
    64 processors (hardware threads)
    physical id 0: core ids 0-31
    physical id 1: core ids 0-31
    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
    physical id 1: apicids
```

(Continued on next page)

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed^{®}2017\_fp\_base = 275$

$SPECspeed^{®}2017\_fp\_peak = 275$

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Feb-2023

Hardware Availability: Feb-2023

Software Availability: Dec-2022

Platform Notes (Continued)

```
   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
  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):                     64
  On-line CPU(s) list:        0-63
  Vendor ID:                  GenuineIntel
  Model name:                 Intel(R) Xeon(R) Gold 6454S
  CPU family:                 6
  Model:                      143
  Thread(s) per core:         1
  Core(s) per socket:         32
  Socket(s):                  2
  Stepping:                   8
  BogoMIPS:                   4400.00
  Flags:                       fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                              clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                                lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                              nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                              ds_cpl 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
                              cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced 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
  L1d cache:                  3 MiB (64 instances)
  L1i cache:                  2 MiB (64 instances)
  L2 cache:                   128 MiB (64 instances)
  L3 cache:                   120 MiB (2 instances)
  NUMA node(s):               4
  NUMA node0 CPU(s):          0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60
  NUMA node1 CPU(s):          2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed^{®}2017\_fp\_base = 275$

$SPECspeed^{®}2017\_fp\_peak = 275$

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

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

Platform Notes (Continued)

```
     NUMA node2 CPU(s):               1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61
     NUMA node3 CPU(s):               3,7,11,15,19,23,27,31,35,39,43,47,51,55,59,63
     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       3M  12 Data              1     64        1             64
      L1i       32K       2M   8 Instruction       1     64        1             64
      L2         2M     128M  16 Unified           2   2048        1             64
      L3        60M     120M  15 Unified           3  65536        1             64


  ----------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 4 nodes (0-3)
   node 0 cpus: 0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60
   node 0 size: 257496 MB
   node 0 free: 256961 MB
   node 1 cpus: 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62
   node 1 size: 258043 MB
   node 1 free: 257924 MB
   node 2 cpus: 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61
   node 2 size: 258009 MB
   node 2 free: 257732 MB
   node 3 cpus: 3,7,11,15,19,23,27,31,35,39,43,47,51,55,59,63
   node 3 size: 258014 MB
   node 3 free: 241684 MB
   node distances:
   node   0   1   2   3
     0:  10  12  21  21
     1:  12  10  21  21
     2:  21  21  10  12
     3:  21  21  12  10


  ----------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       1056321772 kB


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

(Continued on next page)

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed^®2017\_fp\_base = 275$

$SPECspeed^®2017\_fp\_peak = 275$

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

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

Platform Notes (Continued)

```
 10. who -r
   run-level 3 Feb 26 19:08


   ----------------------------------------------------------
 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 auditd cron display-manager getty@ haveged irqbalance
                    issue-generator kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections 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 nvmf-autoconnect 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 udisks2
    indirect        wickedd


   ----------------------------------------------------------
 13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=4b9d6da9-b8b6-435a-9c93-05a14fddaf7b
   splash=silent
   resume=/dev/disk/by-uuid/fb25668a-33ba-4c89-afb9-79ca6e9354ff
   mitigations=auto
   quiet
   security=


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

(Continued on next page)

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed®2017\_fp\_base = 275$

$SPECspeed®2017\_fp\_peak = 275$

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

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

Platform Notes (Continued)

```
  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


  ----------------------------------------------------------------
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  125G   11G  115G   9% /mnt/ramdisk


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

(Continued on next page)

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed^{®}2017\_fp\_base = 275$

$SPECspeed^{®}2017\_fp\_peak = 275$

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

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

Platform Notes (Continued)

```
 20. /sys/devices/virtual/dmi/id
       Vendor:          Dell Inc.
       Product:         PowerEdge R660
       Product Family:  PowerEdge
       Serial:          SLR6603


     ----------------------------------------------------------------
 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:
       16x 00AD063200AD HMCG94MEBRA109N 64 GB 2 rank 4800



     ----------------------------------------------------------------
 22. BIOS
 (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:       Dell Inc.
     BIOS Version:      1.0.1
     BIOS Date:         12/27/2022
     BIOS Revision:     1.0
```

Compiler Version Notes

```
==============================================================================
C                    | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
                     | 644.nab_s(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, Fortran | 607.cactuBSSN_s(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.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2023.0.0 Build 20221201
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed®2017\_fp\_base = 275$

$SPECspeed®2017\_fp\_peak = 275$

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

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

Compiler Version Notes (Continued)

```
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                 | 654.roms_s(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       | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                 | 628.pop2_s(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`

Fortran benchmarks:
`ifx`

Benchmarks using both Fortran and C:
`ifx icx`

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

Base Portability Flags

603.bwaves_s: `-DSPEC_LP64`
607.cactuBSSN_s: `-DSPEC_LP64`
619.lbm_s: `-DSPEC_LP64`

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

SPECspeed®2017_fp_base = 275

SPECspeed®2017_fp_peak = 275

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

Base Portability Flags (Continued)

```
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
```

Base Optimization Flags

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

Fortran benchmarks:
```
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

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

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

Peak Compiler Invocation

C benchmarks:
```
icx
```

(Continued on next page)

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

Dell Inc.

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed®2017\_fp\_base = 275$

$SPECspeed®2017\_fp\_peak = 275$

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

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

Peak Compiler Invocation (Continued)

Fortran benchmarks:
```
ifx
```

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

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

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

619.lbm_s: `basepeak = yes`

638.imagick_s: `basepeak = yes`

644.nab_s: `basepeak = yes`

Fortran benchmarks:

603.bwaves_s: `basepeak = yes`

649.fotonik3d_s: `basepeak = yes`

654.roms_s: `basepeak = yes`

Benchmarks using both Fortran and C:

621.wrf_s: `basepeak = yes`

627.cam4_s: `basepeak = yes`

628.pop2_s: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

(Continued on next page)

Dell Inc.

$SPECspeed^{®}2017\_fp\_base = 275$

PowerEdge R660 (Intel Xeon Gold 6454S)

$SPECspeed^{®}2017\_fp\_peak = 275$

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

Peak Optimization Flags (Continued)

607.cactuBSSN_s: 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.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.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/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.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 2023-02-26 22:51:58-0500.
Report generated on 2023-03-15 10:17:41 by CPU2017 PDF formatter v6442.
Originally published on 2023-03-14.