SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge C6620 (Intel Xeon Platinum 8568Y+)

$SPECspeed®2017\_fp\_base = 392$

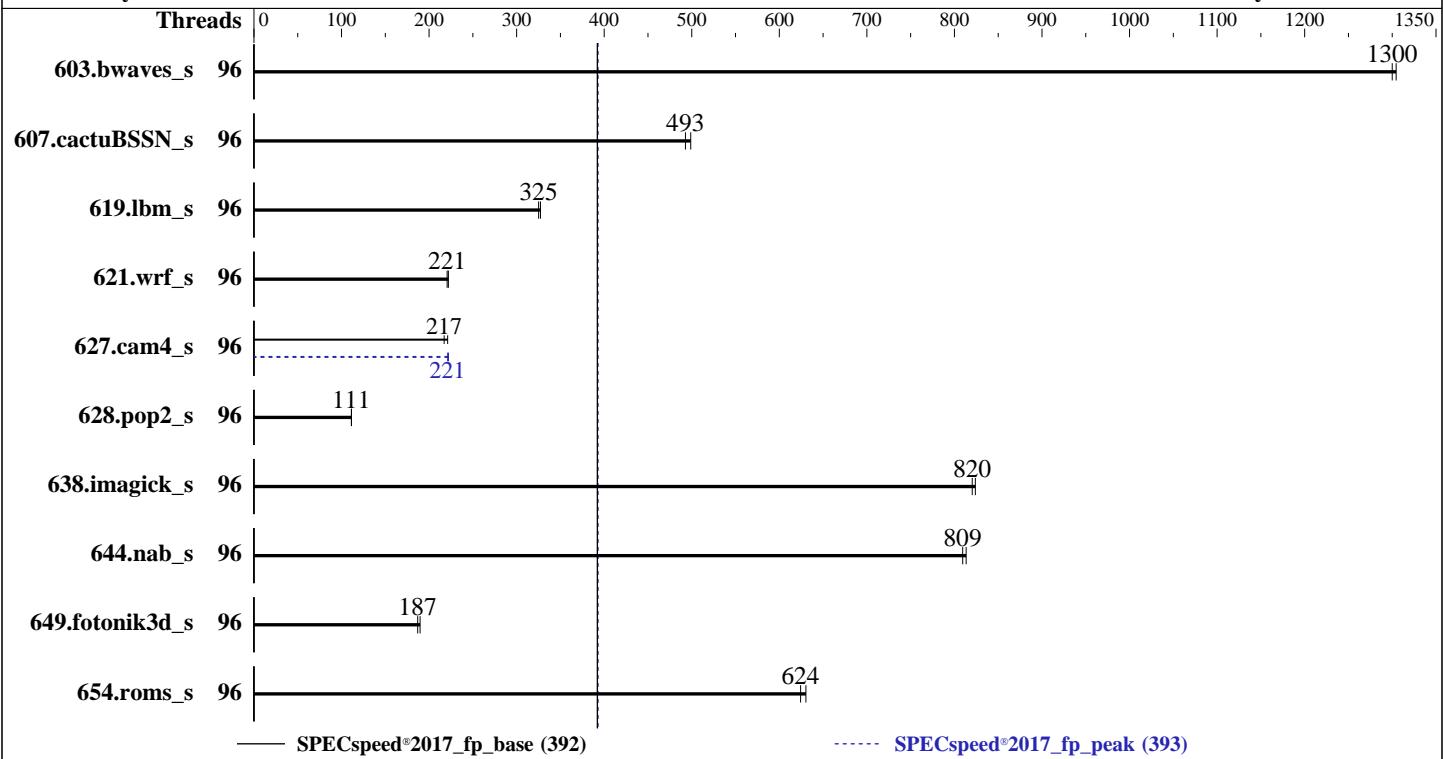$SPECspeed®2017\_fp\_peak = 393$

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

Test Date: Dec-2023
Hardware Availability: Feb-2024
Software Availability: Dec-2023

Threads

Benchmark	Threads	Result
603.bwaves_s	96	1300
607.cactuBSSN_s	96	493
619.lbm_s	96	325
621.wrf_s	96	221
627.cam4_s	96	217 / 221
628.pop2_s	96	111
638.imagick_s	96	820
644.nab_s	96	809
649.fotonik3d_s	96	187
654.roms_s	96	624

SPECspeed®2017_fp_base (392)   SPECspeed®2017_fp_peak (393)

Hardware

CPU Name: Intel Xeon Platinum 8568Y+
 Max MHz: 4000
 Nominal: 2300
Enabled: 96 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: 300 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-5600B-R)
Storage: 70 GB on tmpfs
Other: Cooling: DLC

Software

OS: SUSE Linux Enterprise Server 15 SP5
 5.14.21-150500.53-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 1.9.11 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 Threads	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Threads	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
603.bwaves_s	96	**45.4**	**1300**	45.2	1300			96	**45.4**	**1300**	45.2	1300		
607.cactuBSSN_s	96	33.4	499	**33.8**	**493**			96	33.4	499	**33.8**	**493**		
619.lbm_s	96	**16.1**	**325**	16.0	327			96	**16.1**	**325**	16.0	327		
621.wrf_s	96	**59.9**	**221**	59.6	222			96	**59.9**	**221**	59.6	222		
627.cam4_s	96	**40.8**	**217**	40.1	221			96	**40.1**	**221**	39.9	222		
628.pop2_s	96	107	111	**107**	**111**			96	107	111	**107**	**111**		
638.imagick_s	96	17.5	824	**17.6**	**820**			96	17.5	824	**17.6**	**820**		
644.nab_s	96	21.5	813	**21.6**	**809**			96	21.5	813	**21.6**	**809**		
649.fotonik3d_s	96	48.1	190	**48.7**	**187**			96	48.1	190	**48.7**	**187**		
654.roms_s	96	25.0	630	**25.2**	**624**			96	25.0	630	**25.2**	**624**		

SPECspeed®2017_fp_base =	**392**
SPECspeed®2017_fp_peak =	**393**

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-ic2023.2.3/lib_2023.0/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2023.2.3/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.
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 70 GB ramdisk created with the cmd: "mount -t tmpfs -o size=70G tmpfs /mnt/ramdisk"
```

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Platform Notes

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

              Logical Processor : Disabled
     Virtualization Technology : Disabled
       DCU Streamer Prefetcher : Disabled
                 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-ic2023.2.3/bin/sysinfo
  Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
  running on localhost Fri Dec 22 12:12:34 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. tuned-adm active
  16. sysctl
  17. /sys/kernel/mm/transparent_hugepage
  18. /sys/kernel/mm/transparent_hugepage/khugepaged
  19. OS release
  20. Disk information
  21. /sys/devices/virtual/dmi/id
  22. dmidecode
  23. BIOS
  -----------------------------------------------------------


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

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

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Platform Notes (Continued)

```
 2. w
   12:12:34 up  2:10,  1 user,  load average: 6.11, 5.04, 3.00
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                10:03    2:09m  0.95s  0.00s /bin/bash ./dell-run-speccpu.sh speed
   --define DL-BIOSinc=Dell-BIOS_Xeon-5.inc --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8.6 --output_format
   html,pdf,txt --define DL-LQC=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) 4126136
   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) 4126136
   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-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-5.inc --define DL-BIOS-adddcD=1
   --define DL-VERS=v4.8.6 --output_format html,pdf,txt --define DL-LQC=1
 /bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-5.inc --define DL-BIOS-adddcD=1
   --define DL-VERS=v4.8.6 --output_format html,pdf,txt --define DL-LQC=1
 runcpu --nobuild --action validate --define default-platform-flags -c
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=96 --tune base,peak -o all --define
   drop_caches --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-5.inc --define DL-BIOS-adddcD=1 --define
   DL-VERS=v4.8.6 --output_format html,pdf,txt --define DL-LQC=1 fpspeed
 runcpu --nobuild --action validate --define default-platform-flags --configfile
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=96 --tune base,peak --output_format all
   --define drop_caches --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-5.inc --define DL-BIOS-adddcD=1
   --define DL-VERS=v4.8.6 --output_format html,pdf,txt --define DL-LQC=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-ic2023.2.3

   ------------------------------------------------------------
 6. /proc/cpuinfo
   model name      : INTEL(R) XEON(R) PLATINUM 8568Y+
   vendor_id       : GenuineIntel
   cpu family      : 6
```

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Platform Notes (Continued)

```
     model           : 207
     stepping        : 2
     microcode       : 0x210001a0
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
     cpu cores       : 48
     siblings        : 48
     2 physical ids (chips)
     96 processors (hardware threads)
     physical id 0: core ids 0-47
     physical id 1: core ids 0-47
     physical id 0: apicids
     0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72
     ,74,76,78,80,82,84,86,88,90,92,94
     physical id 1: apicids
     128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
     80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222
  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:             46 bits physical, 57 bits virtual
   Byte Order:                Little Endian
   CPU(s):                    96
   On-line CPU(s) list:       0-95
   Vendor ID:                 GenuineIntel
   Model name:                INTEL(R) XEON(R) PLATINUM 8568Y+
   CPU family:                6
   Model:                     207
   Thread(s) per core:        1
   Core(s) per socket:        48
   Socket(s):                 2
   Stepping:                  2
   BogoMIPS:                  4600.00
   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 avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts hfi
                              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:                 4.5 MiB (96 instances)
   L1i cache:                 3 MiB (96 instances)
   L2 cache:                  192 MiB (96 instances)
   L3 cache:                  600 MiB (2 instances)
   NUMA node(s):              2
   NUMA node0 CPU(s):         0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,5
```

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Platform Notes (Continued)

```
                              2,54,56,58,60,62,64,66,68,70,72,74,76,78,80,82,84,86,88,90,92,94
    NUMA node1 CPU(s):        1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,5
                              3,55,57,59,61,63,65,67,69,71,73,75,77,79,81,83,85,87,89,91,93,95
  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     4.5M  12 Data              1      64        1             64
      L1i       32K       3M   8 Instruction       1      64        1             64
      L2         2M     192M  16 Unified           2    2048        1             64
      L3       300M     600M  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:
  0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72,7
  4,76,78,80,82,84,86,88,90,92,94
  node 0 size: 515501 MB
  node 0 free: 514706 MB
  node 1 cpus:
  1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59,61,63,65,67,69,71,73,7
  5,77,79,81,83,85,87,89,91,93,95
  node 1 size: 516062 MB
  node 1 free: 500430 MB
  node distances:
  node    0    1
    0:   10   21
    1:   21   10

  --------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1056321712 kB

  --------------------------------------------------------------
10. who -r
   run-level 3 Dec 22 10:02

  --------------------------------------------------------------
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          YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager firewalld getty@
                    irqbalance issue-generator kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections
```

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Platform Notes (Continued)

```
                    postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore tuned 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 gpm
                    grub2-once haveged haveged-switch-root ipmi ipmievd issue-add-ssh-keys kexec-load lunmask
                    man-db-create multipathd nfs nfs-blkmap nvmf-autoconnect 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
                    vncserver@
   indirect         wickedd


   ----------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
   root=UUID=a980d06c-c41f-4c9d-8603-80e11879418a
   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. tuned-adm active
   Current active profile: throughput-performance


   ----------------------------------------------------------------
16. 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                  10
   vm.watermark_boost_factor   15000
   vm.watermark_scale_factor      10
   vm.zone_reclaim_mode            0


   ----------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
   defrag          always defer defer+madvise [madvise] never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
```

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Platform Notes (Continued)

```
   shmem_enabled   always within_size advise [never] deny force


   ----------------------------------------------------------------
18. /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


   ----------------------------------------------------------------
19. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP5


   ----------------------------------------------------------------
20. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2023.2.3
   Filesystem      Type   Size  Used Avail Use% Mounted on
   tmpfs           tmpfs   70G   11G   60G  15% /mnt/ramdisk


   ----------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
     Vendor:        Dell Inc.
     Product:       PowerEdge C6620
     Product Family: PowerEdge
     Serial:        SC662L1


   ----------------------------------------------------------------
22. 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:
     16x 00CE042300CE M321R8GA0PB0-CWMCH 64 GB 2 rank 5600


   ----------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:      Dell Inc.
     BIOS Version:     1.9.11
     BIOS Date:        10/26/2023
     BIOS Revision:    1.9
```

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
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------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
```

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SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

$SPECspeed^{®}2017\_fp\_base = 392$

PowerEdge C6620 (Intel Xeon Platinum 8568Y+)

$SPECspeed^{®}2017\_fp\_peak = 393$

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2023

Hardware Availability: Feb-2024

Software Availability: Dec-2023

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
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--------------------------------------------------------------------------------


================================================================================
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
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--------------------------------------------------------------------------------


================================================================================
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
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--------------------------------------------------------------------------------
```

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`
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`

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SPEC CPU®2017 Floating Point Speed Result

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PowerEdge C6620 (Intel Xeon Platinum 8568Y+)

SPECspeed®2017_fp_base = 392

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CPU2017 License: 6573
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Hardware Availability: Feb-2024
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Base Portability Flags (Continued)

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
```

Fortran benchmarks:
```
ifx
```

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PowerEdge C6620 (Intel Xeon Platinum 8568Y+)

SPECspeed®2017_fp_base = 392

SPECspeed®2017_fp_peak = 393

Peak Compiler Invocation (Continued)

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: -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

628.pop2_s: basepeak = yes

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SPEC CPU®2017 Floating Point Speed Result

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PowerEdge C6620 (Intel Xeon Platinum 8568Y+)

SPECspeed®2017_fp_base = 392

SPECspeed®2017_fp_peak = 393

CPU2017 License: 6573		**Test Date:**	Dec-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Feb-2024
Tested by:	Dell Inc.	**Software Availability:**	Dec-2023

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

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-v1.6.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.xml

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

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