SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

$SPECspeed^{®}2017\_fp\_base = 323$

PowerEdge R760 (Intel Xeon Max 9460)

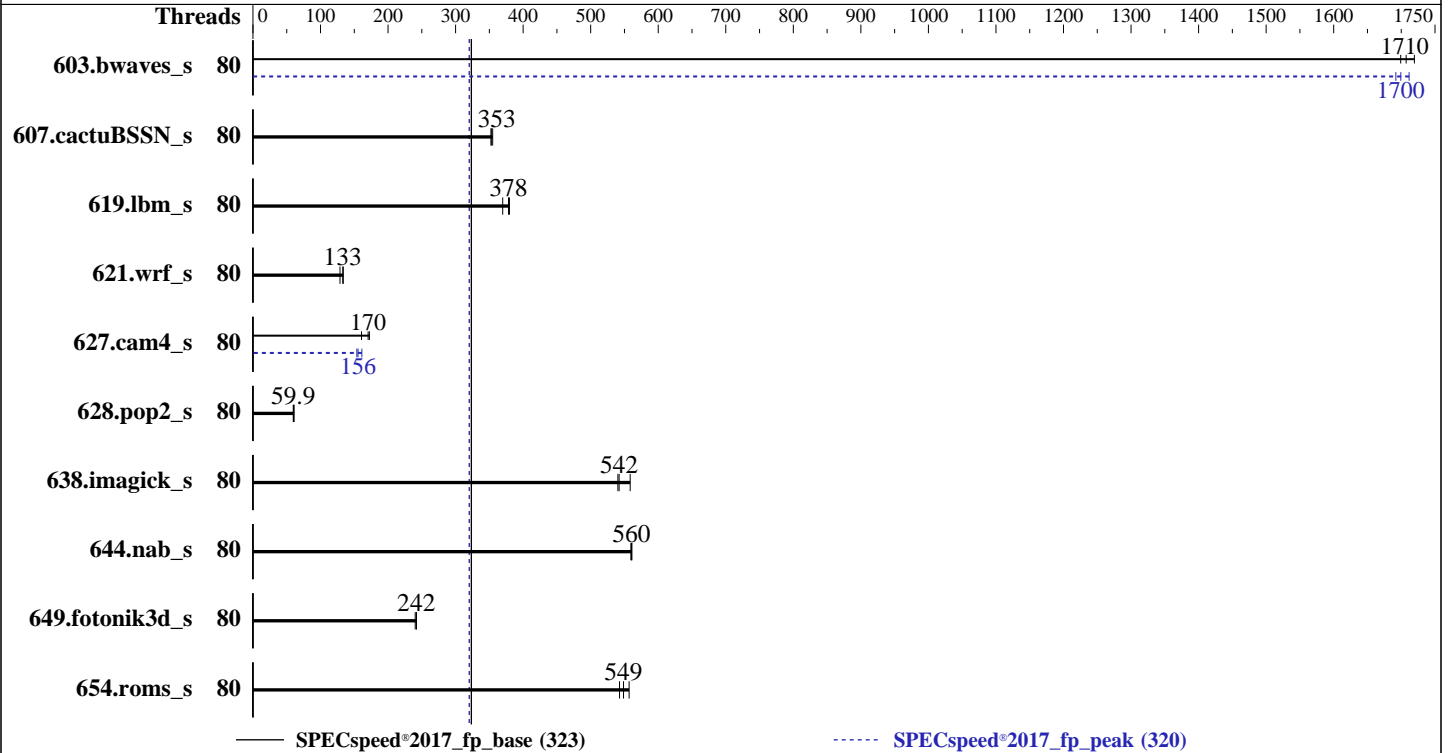$SPECspeed^{®}2017\_fp\_peak = 320$

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

Test Date: Apr-2024
Hardware Availability: May-2023
Software Availability: Dec-2023

Threads scale: 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1750

Benchmark	Threads	base	peak
603.bwaves_s	80	1710	1700
607.cactuBSSN_s	80	353	
619.lbm_s	80	378	
621.wrf_s	80	133	
627.cam4_s	80	170	156
628.pop2_s	80	59.9	
638.imagick_s	80	542	
644.nab_s	80	560	
649.fotonik3d_s	80	242	
654.roms_s	80	549	

SPECspeed®2017_fp_base (323)   SPECspeed®2017_fp_peak (320)

Hardware

CPU Name: Intel Xeon Max 9460
 Max MHz: 3500
 Nominal: 2200
Enabled: 80 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: 97.5 MB I+D on chip per chip
 Other: None
Memory: 128 GB (8 x 16 GB HBM)
Storage: 240 GB SATA SSD
Other: CPU Cooling: DLC

Software

OS: SUSE Linux Enterprise Server 15 SP4
 5.14.21-150400.24.81-default
Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 2.1.5 released Mar-2024
File System: btrfs
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	Threads	Base Seconds	Base Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Peak Seconds	Peak Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	80	**34.6**	**1710**	34.3	1720	34.7	1700	80	34.9	1690	**34.7**	**1700**	34.5	1710
607.cactuBSSN_s	80	**47.3**	**353**	47.0	355	47.3	352	80	**47.3**	**353**	47.0	355	47.3	352
619.lbm_s	80	14.2	370	**13.8**	**378**	13.8	380	80	14.2	370	**13.8**	**378**	13.8	380
621.wrf_s	80	103	129	98.9	134	**99.5**	**133**	80	103	129	98.9	134	**99.5**	**133**
627.cam4_s	80	55.1	161	51.4	172	**52.0**	**170**	80	57.6	154	55.0	161	**57.0**	**156**
628.pop2_s	80	**198**	**59.9**	199	59.7	195	61.0	80	**198**	**59.9**	199	59.7	195	61.0
638.imagick_s	80	**26.6**	**542**	26.7	540	25.8	558	80	**26.6**	**542**	26.7	540	25.8	558
644.nab_s	80	31.1	561	31.2	559	**31.2**	**560**	80	31.1	561	31.2	559	**31.2**	**560**
649.fotonik3d_s	80	38.0	240	**37.7**	**242**	37.7	242	80	38.0	240	**37.7**	**242**	37.7	242
654.roms_s	80	29.0	543	28.3	557	**28.7**	**549**	80	29.0	543	28.3	557	**28.7**	**549**

SPECspeed®2017_fp_base = **323**
SPECspeed®2017_fp_peak = **320**

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 = "/home/cpu2017-1.1.9-ic2024.0.2/lib/intel64:/home/cpu2017-1.1.9-ic2024.0.2/je5.0.1-64"
MALLOC_CONF = "retain:true"
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.
```

Platform Notes

```
BIOS settings:
```

(Continued on next page)

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Platform Notes (Continued)

```
              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 /home/cpu2017-1.1.9-ic2024.0.2/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on sut Sun Apr 28 10:39:43 2024

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

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.16+suse.195.gb473c02cc0)
 12. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
 14. Linux kernel boot-time arguments, from /proc/cmdline
 15. cpupower frequency-info
 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 sut 5.14.21-150400.24.81-default #1 SMP PREEMPT_DYNAMIC Tue Aug 8 14:10:43 UTC 2023 (90a74a8) x86_64
   x86_64 x86_64 GNU/Linux

 ------------------------------------------------------------
 2. w
    10:39:43 up  3:44,  1 user,  load average: 6.26, 6.13, 3.60
```

(Continued on next page)

Dell Inc.

SPECspeed®2017_fp_base = 323

PowerEdge R760 (Intel Xeon Max 9460)

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Platform Notes (Continued)

```
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                06:58    3:40m  1.04s  0.00s -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) 513405
  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) 513405
  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
 -bash
 runcpu --nobuild --action validate --define default-platform-flags -c
   ic2024.0.2-lin-sapphirerapids-speed-20231213.cfg --define cores=80 --tune base,peak -o all --define
   drop_caches fpspeed
 runcpu --nobuild --action validate --define default-platform-flags --configfile
   ic2024.0.2-lin-sapphirerapids-speed-20231213.cfg --define cores=80 --tune base,peak --output_format all
   --define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv
   --note-preenv --logfile $SPEC/tmp/CPU2017.004/templogs/preenv.fpspeed.004.0.log --lognum 004.0
   --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017-1.1.9-ic2024.0.2


  -------------------------------------------------------------
6. /proc/cpuinfo
   model name      : Intel (R) Xeon (R) CPU Max 9460
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 8
   microcode       : 0x2c000351
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   cpu cores       : 40
   siblings        : 40
   2 physical ids (chips)
   80 processors (hardware threads)
   physical id 0: core ids 0-39
   physical id 1: core ids 0-39
   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
```

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Dell Inc.

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Platform Notes (Continued)

```
   ,74,76,78
   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
 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):                         80
  On-line CPU(s) list:            0-79
  Vendor ID:                      GenuineIntel
  Model name:                     Intel (R) Xeon (R) CPU Max 9460
  CPU family:                     6
  Model:                          143
  Thread(s) per core:             1
  Core(s) per socket:             40
  Socket(s):                      2
  Stepping:                       8
  CPU max MHz:                    3500.0000
  CPU min MHz:                    800.0000
  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:                      3.8 MiB (80 instances)
  L1i cache:                      2.5 MiB (80 instances)
  L2 cache:                       160 MiB (80 instances)
  L3 cache:                       195 MiB (2 instances)
  NUMA node(s):                   2
  NUMA node0 CPU(s):              0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,5
                                  0,52,54,56,58,60,62,64,66,68,70,72,74,76,78
  NUMA node1 CPU(s):              1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,5
                                  1,53,55,57,59,61,63,65,67,69,71,73,75,77,79
  Vulnerability Gather data sampling: Not affected
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         Not affected
  Vulnerability Mmio stale data:  Not affected
```

(Continued on next page)

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Platform Notes (Continued)

```
  Vulnerability Retbleed:             Not affected
  Vulnerability Spec rstack overflow: 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     3.8M   12 Data            1     64        1             64
      L1i       32K     2.5M    8 Instruction     1     64        1             64
      L2         2M     160M   16 Unified         2   2048        1             64
      L3      97.5M     195M   15 Unified         3 106496        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
  node 0 size: 63908 MB
  node 0 free: 55648 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
  node 1 size: 64472 MB
  node 1 free: 63966 MB
  node distances:
  node   0   1
    0:  10  23
    1:  23  10

  ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       131461736 kB

  ------------------------------------------------------------
10. who -r
   run-level 3 Apr 28 06:55

  ------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.16+suse.195.gb473c02cc0)
   Default Target  Status
   multi-user      degraded

  ------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
     UNIT           LOAD   ACTIVE SUB    DESCRIPTION
   * postfix.service loaded failed failed Postfix Mail Transport Agent
   * smartd.service  loaded failed failed Self Monitoring and Reporting Technology (SMART) Daemon

  ------------------------------------------------------------
13. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                   YaST2-Firstboot YaST2-Second-Stage auditd bluetooth cron display-manager getty@ haveged
                   irqbalance iscsi issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels
```

(Continued on next page)

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Platform Notes (Continued)

```
                    rollback rsyslog smartd sshd systemd-pstore wpa_supplicant
  enabled-runtime   systemd-remount-fs
  disabled          accounts-daemon apparmor appstream-sync-cache 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
                    fancontrol firewalld gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd
                    iscsi-init iscsid iscsiuio issue-add-ssh-keys kexec-load lm_sensors lunmask man-db-create
                    multipathd ndctl-monitor nfs nfs-blkmap nfs-server nfsserver nm-cloud-setup nmb
                    ostree-remount power-profiles-daemon rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon
                    serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd svnserve
                    systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                    systemd-time-wait-sync systemd-timesyncd udisks2 upower wicked wickedd-auto4 wickedd-dhcp4
                    wickedd-dhcp6 wickedd-nanny wpa_supplicant@
  indirect          pcscd wickedd

  ----------------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.24.81-default
  root=UUID=1370a640-700c-4b25-a152-2c5f9290f614
  splash=silent
  mitigations=auto
  quiet
  security=apparmorpcie_aspm=force
  pcie_aspm.policy=powersave
  intel_pstate=passive

  ----------------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 3.50 GHz.
                    The governor "ondemand" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes

  ----------------------------------------------------------------
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                      60
  vm.watermark_boost_factor       15000
  vm.watermark_scale_factor          10
  vm.zone_reclaim_mode                0

  ----------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
```

(Continued on next page)

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Platform Notes (Continued)

```
  defrag           always defer defer+madvise [madvise] never
  enabled          [always] madvise never
  hpage_pmd_size   2097152
  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 SP4

    ----------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017-1.1.9-ic2024.0.2
  Filesystem      Type   Size  Used Avail Use% Mounted on
  /dev/sda3       btrfs  219G  211G  6.7G  97% /home

    ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Dell Inc.
    Product:        PowerEdge R760
    Product Family: PowerEdge
    Serial:         SLR7604

    ----------------------------------------------------------
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:
    8x 00CE 43 16 GB 3200


    ----------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:      Dell Inc.
    BIOS Version:     2.1.5
    BIOS Date:        03/14/2024
    BIOS Revision:    2.1
```

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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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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 2024.0.2 Build 20231213
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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 2024.0.2 Build 20231213
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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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`

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

PowerEdge R760 (Intel Xeon Max 9460)

SPECspeed®2017_fp_base = 323

SPECspeed®2017_fp_peak = 320

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

Base Portability Flags (Continued)

```
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:
```
-w -std=c11 -m64 -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:
```
-w -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:
```
-w -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++:
```
-w -std=c++14 -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
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

(Continued on next page)

Dell Inc.

PowerEdge R760 (Intel Xeon Max 9460)

SPECspeed®2017_fp_base = 323

SPECspeed®2017_fp_peak = 320

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

Test Date: Apr-2024
Hardware Availability: May-2023
Software Availability: Dec-2023

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: `-w -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`

649.fotonik3d_s: `basepeak = yes`

654.roms_s: `basepeak = yes`

Benchmarks using both Fortran and C:

621.wrf_s: `basepeak = yes`

627.cam4_s: `-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP`

(Continued on next page)

Dell Inc.

PowerEdge R760 (Intel Xeon Max 9460)

SPECspeed®2017_fp_base = 323

SPECspeed®2017_fp_peak = 320

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

Peak Optimization Flags (Continued)

627.cam4_s (continued):
```
-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

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-ic2024-official-linux64.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.9.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.9.xml
```

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

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