# SPEC CPU®2017 Floating Point Speed Result

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## Dell Inc.

$SPECspeed^{®}2017\_fp\_base = 180$

### PowerEdge XR7620 (Intel Xeon Silver 4410Y)
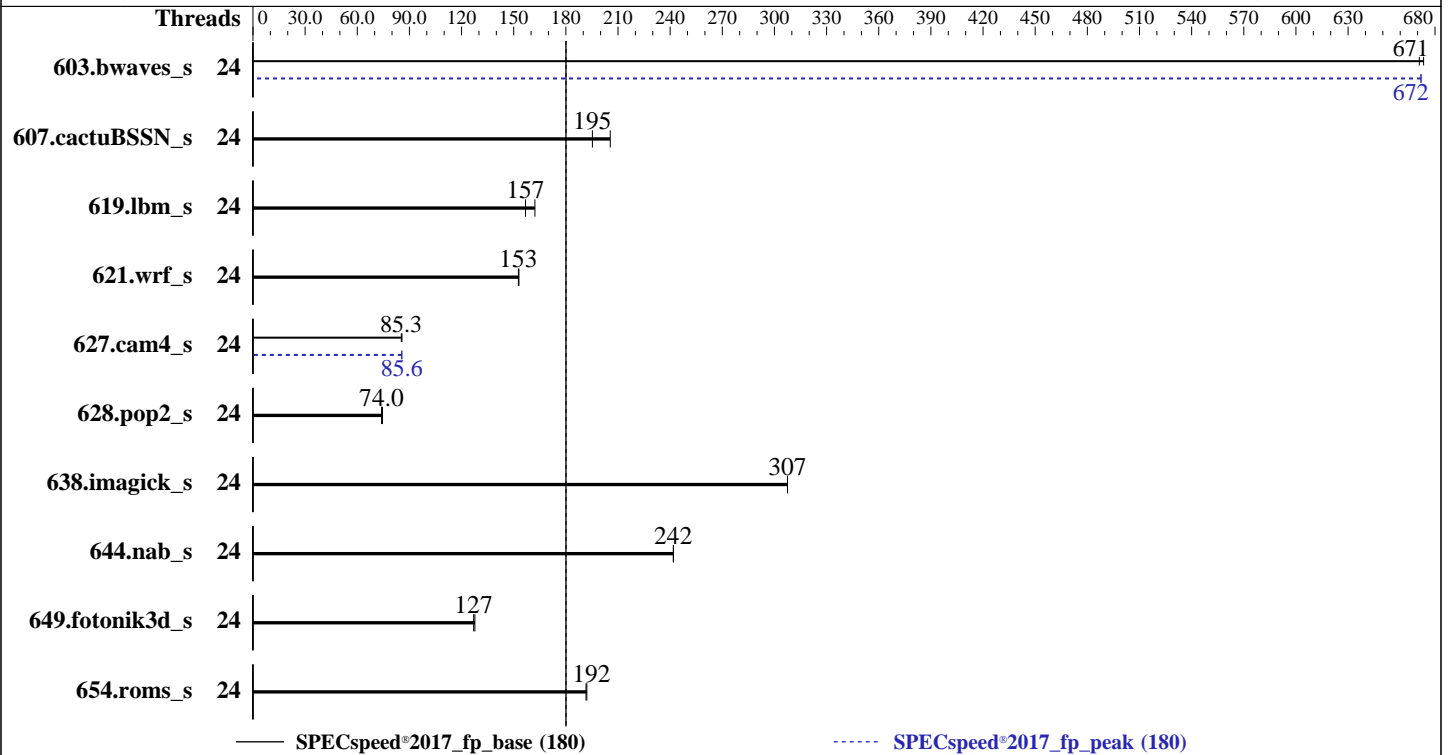
$SPECspeed^{®}2017\_fp\_peak = 180$

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

**Test Date:** May-2023
**Hardware Availability:** May-2023
**Software Availability:** Dec-2022



**Threads** scale: 0 30.0 60.0 90.0 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630 680

| Benchmark | Threads | Value |
|---|---|---|
| 603.bwaves_s | 24 | 671 / 672 |
| 607.cactuBSSN_s | 24 | 195 |
| 619.lbm_s | 24 | 157 |
| 621.wrf_s | 24 | 153 |
| 627.cam4_s | 24 | 85.3 / 85.6 |
| 628.pop2_s | 24 | 74.0 |
| 638.imagick_s | 24 | 307 |
| 644.nab_s | 24 | 242 |
| 649.fotonik3d_s | 24 | 127 |
| 654.roms_s | 24 | 192 |

SPECspeed®2017_fp_base (180) ——————   SPECspeed®2017_fp_peak (180) - - - - -

## Hardware

CPU Name: Intel Xeon Silver 4410Y
Max MHz: 3900
Nominal: 2000
Enabled: 24 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: 30 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R, running at 4000)
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: Yes
Firmware: Version 1.0.1 released Mar-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.

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

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s | 24 | 87.6 | 673 | **87.9** | **671** | | | 24 | **87.8** | **672** | 87.8 | 672 | | |
| 607.cactuBSSN_s | 24 | **85.4** | **195** | 81.1 | 206 | | | 24 | **85.4** | **195** | 81.1 | 206 | | |
| 619.lbm_s | 24 | **33.4** | **157** | 32.3 | 162 | | | 24 | **33.4** | **157** | 32.3 | 162 | | |
| 621.wrf_s | 24 | **86.6** | **153** | 86.4 | 153 | | | 24 | **86.6** | **153** | 86.4 | 153 | | |
| 627.cam4_s | 24 | 103 | 85.7 | **104** | **85.3** | | | 24 | 103 | 85.7 | **104** | **85.6** | | |
| 628.pop2_s | 24 | **160** | **74.0** | 159 | 74.5 | | | 24 | **160** | **74.0** | 159 | 74.5 | | |
| 638.imagick_s | 24 | 46.9 | 308 | **46.9** | **307** | | | 24 | 46.9 | 308 | **46.9** | **307** | | |
| 644.nab_s | 24 | 72.2 | 242 | **72.3** | **242** | | | 24 | 72.2 | 242 | **72.3** | **242** | | |
| 649.fotonik3d_s | 24 | **71.8** | **127** | 71.4 | 128 | | | 24 | **71.8** | **127** | 71.4 | 128 | | |
| 654.roms_s | 24 | 82.0 | 192 | **82.2** | **192** | | | 24 | 82.0 | 192 | **82.2** | **192** | | |
| **SPECspeed®2017_fp_base =** | **180** | | | | | | | | | | | | | |
| **SPECspeed®2017_fp_peak =** | **180** | | | | | | | | | | | | | |

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.
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"
```

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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
               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 Tue May 30 20:01:15 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
-----------------------------------------------------------


-----------------------------------------------------------
1. uname -a
  Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222/lp)
  x86_64 x86_64 x86_64 GNU/Linux


-----------------------------------------------------------
2. w
   20:01:15 up  2:43,  1 user,  load average: 6.10, 5.88, 3.52
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
```

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## Platform Notes (Continued)

```
   root     tty1      -                17:18    2:43m  1.24s  0.00s /bin/bash ./dell-run-speccpu.sh speed
  --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProcD=1 --define DL-BIOS-adddcD=1 --define
  DL-BIOS-VirtD=1 --output_format csv,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) 4124685
   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) 4124685
   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-4.inc --define DL-BIOS-LogProcD=1
   --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt
 /bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProcD=1
   --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt
 runcpu --nobuild --action validate --define default-platform-flags -c
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=24 --tune base,peak -o all --define
   drop_caches --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProcD=1 --define
   DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt fpspeed
 runcpu --nobuild --action validate --define default-platform-flags --configfile
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=24 --tune base,peak --output_format all
   --define drop_caches --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProcD=1
   --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt --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) Silver 4410Y
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b0001b0
```

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## Platform Notes (Continued)

```
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
     cpu cores       : 12
     siblings        : 12
     2 physical ids (chips)
     24 processors (hardware threads)
     physical id 0: core ids 0-11
     physical id 1: core ids 0-11
     physical id 0: apicids 0,2,4,6,8,10,12,14,16,18,20,22
     physical id 1: apicids 128,130,132,134,136,138,140,142,144,146,148,150
   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):                   24
      On-line CPU(s) list:      0-23
      Vendor ID:                GenuineIntel
      Model name:               Intel(R) Xeon(R) Silver 4410Y
      CPU family:               6
      Model:                    143
      Thread(s) per core:       1
      Core(s) per socket:       12
      Socket(s):                2
      Stepping:                 8
      BogoMIPS:                 4000.00
      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:                1.1 MiB (24 instances)
      L1i cache:                768 KiB (24 instances)
      L2 cache:                 48 MiB (24 instances)
      L3 cache:                 60 MiB (2 instances)
      NUMA node(s):             2
      NUMA node0 CPU(s):        0,2,4,6,8,10,12,14,16,18,20,22
      NUMA node1 CPU(s):        1,3,5,7,9,11,13,15,17,19,21,23
      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
```

**(Continued on next page)**

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| | | | |
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## Platform Notes (Continued)

```
  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     1.1M   12 Data            1    64        1             64
      L1i       32K     768K    8 Instruction     1    64        1             64
      L2         2M      48M   16 Unified         2  2048        1             64
      L3        30M      60M   15 Unified         3 32768        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
    node 0 size: 515438 MB
    node 0 free: 514356 MB
    node 1 cpus: 1,3,5,7,9,11,13,15,17,19,21,23
    node 1 size: 515757 MB
    node 1 free: 506206 MB
    node distances:
    node   0   1
      0:  10  21
      1:  21  10

  ------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       1055944648 kB

  ------------------------------------------------------------
  10. who -r
    run-level 3 May 30 17:18

  ------------------------------------------------------------
  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 bluetooth cron display-manager
                     firewalld getty@ haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early
                     klog libvirtd lvm2-monitor nscd nvmefc-boot-connections oracle postfix purge-kernels
                     rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
                     wickedd-nanny xencommons
    enabled-runtime  systemd-remount-fs
    disabled         accounts-daemon amavis apache2 apache2@ appstream-sync-cache autofs autoyast-initscripts
                     bgpd blk-availability bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd
                     clamav-milter clamd console-getty cups cups-browsed ddclient debug-shell dhcpd dhcpd6
                     dhcrelay dhcrelay6 dirsrv@ dnsmasq ebtables exchange-bmc-os-info fetchmail freshclam gpm
                     grub2-once haveged-switch-root hwloc-dump-hwdata instsvcdrv ipmi ipmievd iscsi-init iscsid
                     iscsiuio isisd issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask
                     man-db-create mariadb mariadb@ multipathd named nfs nfs-blkmap nfs-server nfsserver nmb
                     nvmf-autoconnect ospf6d ospfd ostree-remount racoon racoon-setkey radvd rarpd@ rdisc ripd
                     ripngd rpcbind rpmconfigcheck rsyncd rtkit-daemon sapconf serial-getty@
                     smartd_generate_opts smb snmpd snmptrapd spamd spampd speech-dispatcherd squid srp_daemon
                     srp_daemon_port@ strongswan strongswan-starter svnserve sysstat
                     systemd-boot-check-no-failures systemd-network-generator systemd-nspawn@ systemd-sysext
```

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## Platform Notes (Continued)

```
                 systemd-time-wait-sync systemd-timesyncd tcsd udisks2 upower virtinterfaced virtnetworkd
                 virtnodedevd virtnwfilterd virtproxyd virtqemud virtsecretd virtstoraged virtxend vsftpd
                 winbind xen-dom0-modules xen-init-dom0 xen-qemu-dom0-disk-backend xen-watchdog xenconsoled
                 xendomains xenstored zebra
  indirect       pcscd uuidd virtlockd virtlogd wickedd

  ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
  root=UUID=35458c4c-5e83-48b0-808c-9f9263c843b9
  splash=silent
  mitigations=auto
  quiet
  security=apparmor
  crashkernel=320M,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           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                   20
  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
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
    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   40G  4.3G   36G  11% /mnt/ramdisk


  ------------------------------------------------------------
  20. /sys/devices/virtual/dmi/id
      Vendor:         Dell Inc.
      Product:        PowerEdge XR7620
      Product Family: PowerEdge
      Serial:         DULAC01


  ------------------------------------------------------------
  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:
      14x 00CE00B300CE M321R8GA0BB0-CQKEG 64 GB 2 rank 4800, configured at 4000
      2x 00CE069D00CE M321R8GA0BB0-CQKVE 64 GB 2 rank 4800, configured at 4000


  ------------------------------------------------------------
  22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:       Dell Inc.
     BIOS Version:      1.0.1
     BIOS Date:         03/09/2023
     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
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
```

**(Continued on next page)**

# SPEC CPU®2017 Floating Point Speed Result

## Dell Inc.

PowerEdge XR7620 (Intel Xeon Silver 4410Y)

$SPECspeed^{®}2017\_fp\_base = 180$

$SPECspeed^{®}2017\_fp\_peak = 180$

## Compiler Version Notes (Continued)

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

==============================================================================
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`
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`

# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge XR7620 (Intel Xeon Silver 4410Y)

$SPECspeed^{®}2017\_fp\_base = 180$

$SPECspeed^{®}2017\_fp\_peak = 180$

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

**Test Date:** May-2023
**Hardware Availability:** May-2023
**Software Availability:** Dec-2022

# 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
```

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

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

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 XR7620 (Intel Xeon Silver 4410Y)

$SPECspeed®2017\_fp\_base = 180$

$SPECspeed®2017\_fp\_peak = 180$

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

**Test Date:** May-2023
**Hardware Availability:** May-2023
**Software Availability:** Dec-2022

## 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: `-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: `-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

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

# SPEC CPU®2017 Floating Point Speed Result

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## Dell Inc.

PowerEdge XR7620 (Intel Xeon Silver 4410Y)

$SPECspeed®2017\_fp\_base = 180$

$SPECspeed®2017\_fp\_peak = 180$

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-v1.4.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-v1.4.xml

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

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