SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

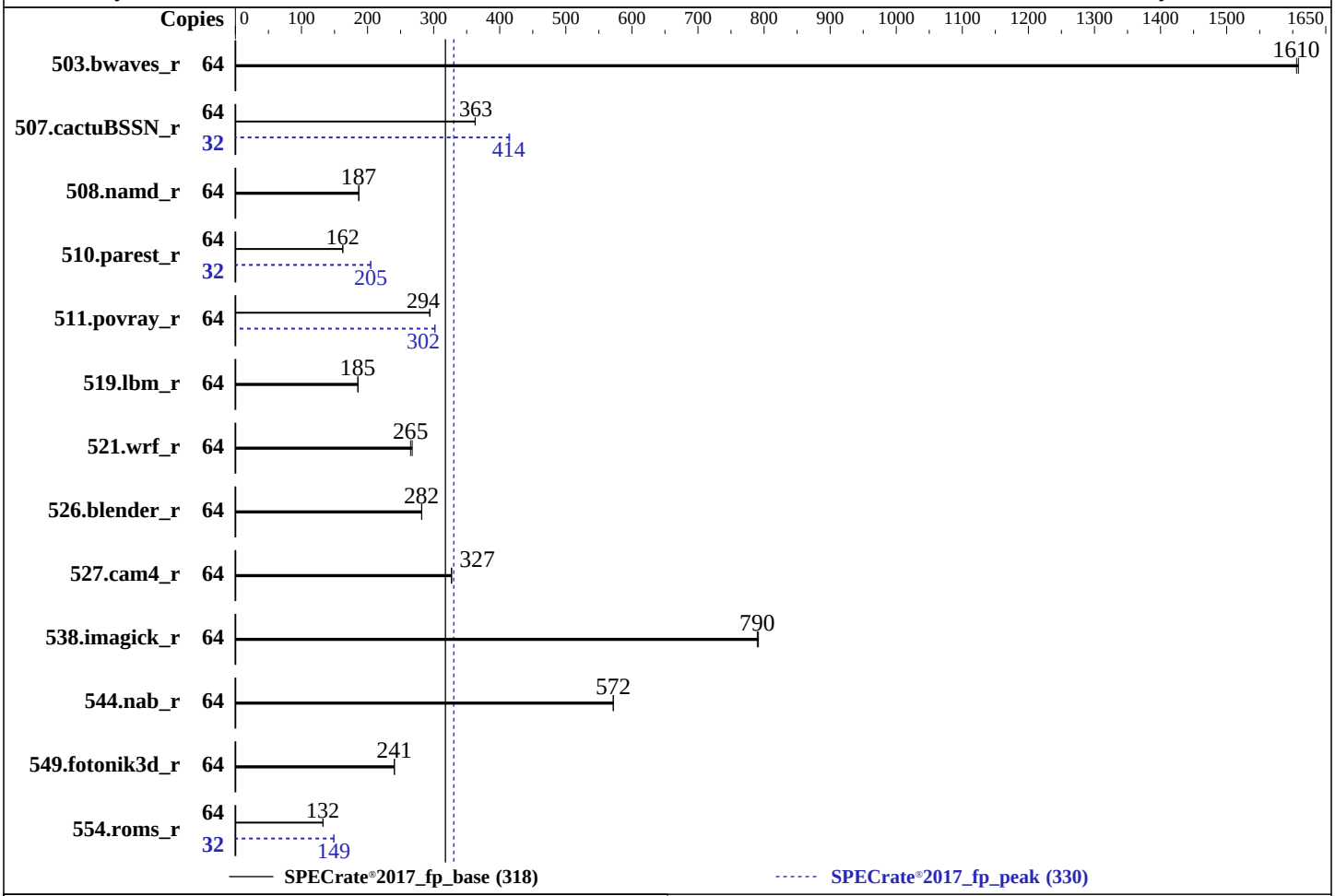
Precision 7960 Rack (Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 318

SPECrate®2017_fp_peak = 330

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

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



Hardware

CPU Name:	Intel Xeon Gold 6430
Max MHz:	3400
Nominal:	2100
Enabled:	32 cores, 1 chip, 2 threads/core
Orderable:	1 chip
Cache L1:	32 KB I + 48 KB D on chip per core
L2:	2 MB I+D on chip per core
L3:	60 MB I+D on chip per chip
Other:	None
Memory:	512 GB (8 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)
Storage:	60 GB on tmpfs
Other:	None

Software

OS:	Ubuntu 22.04.2 LTS 6.2.0-34-generic
Compiler:	C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel:	No
Firmware:	Version 1.5.6 released Jul-2023
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other:	jemalloc memory allocator V5.0.1
Power Management:	BIOS and OS set to prefer performance at the cost of additional power usage.

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

Precision 7960 Rack (Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 318

SPECrate®2017_fp_peak = 330

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

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	64	**400**	**1610**	399	1610			64	**400**	**1610**	399	1610		
507.cactuBSSN_r	64	223	363	**223**	**363**			32	97.6	415	**97.9**	**414**		
508.namd_r	64	325	187	**326**	**187**			64	325	187	**326**	**187**		
510.parest_r	64	1029	163	**1031**	**162**			32	**409**	**205**	409	205		
511.povray_r	64	**508**	**294**	508	294			64	495	302	**495**	**302**		
519.lbm_r	64	363	186	**364**	**185**			64	363	186	**364**	**185**		
521.wrf_r	64	**541**	**265**	536	268			64	**541**	**265**	536	268		
526.blender_r	64	**346**	**282**	346	282			64	**346**	**282**	346	282		
527.cam4_r	64	**342**	**327**	342	327			64	**342**	**327**	342	327		
538.imagick_r	64	**202**	**790**	201	791			64	**202**	**790**	201	791		
544.nab_r	64	**188**	**572**	188	572			64	**188**	**572**	188	572		
549.fotonik3d_r	64	1037	241	**1037**	**241**			64	1037	241	**1037**	**241**		
554.roms_r	64	767	133	**768**	**132**			32	341	149	**341**	**149**		

SPECrate®2017_fp_base = 318

SPECrate®2017_fp_peak = 330

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
      "/mnt/ramdisk/cpu2017-1.1.9-ic2023.0/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2023.0/je5.0.1-64"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>       /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
jemalloc, a general purpose malloc implementation
```

(Continued on next page)

General Notes (Continued)

```
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 60 GB ramdisk created with the cmd: "mount -t tmpfs -o size=60G tmpfs /mnt/ramdisk"
```

Platform Notes

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

     Virtualization Technology : Disabled
       DCU Streamer Prefetcher : Disabled
              Sub NUMA Cluster : 4-way Clustering
                  LLC Prefetch : Disabled
          Dead Line LLC Alloc : 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 dell-Precision-7960-Rack Wed Oct 11 14:54:29 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 (249.11-0ubuntu3.7)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. sysctl
```

(Continued on next page)

Platform Notes (Continued)

```
15. /sys/kernel/mm/transparent_hugepage
16. /sys/kernel/mm/transparent_hugepage/khugepaged
17. OS release
18. Disk information
19. /sys/devices/virtual/dmi/id
20. dmidecode
21. BIOS
------------------------------------------------------------

------------------------------------------------------------
1. uname -a
  Linux dell-Precision-7960-Rack 6.2.0-34-generic #34~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Thu Sep  7 13:12:03
  UTC 2 x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   14:54:29 up  4:39,  3 users,  load average: 39.55, 57.94, 61.63
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  dell     tty1     -                10:16    4:33m  0.79s  0.02s -bash
  dell     pts/0    -                10:21    4:33m  0.97s  0.61s sudo ./DELL_rate.sh

------------------------------------------------------------
3. Username
  From environment variable $USER:  root
  From the command 'logname':       dell

------------------------------------------------------------
4. ulimit -a
  time(seconds)        unlimited
  file(blocks)         unlimited
  data(kbytes)         unlimited
  stack(kbytes)        unlimited
  coredump(blocks)     0
  memory(kbytes)       unlimited
  locked memory(kbytes) 66004516
  process              2062343
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
  rtprio               0

------------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init splash
 /bin/login -p --
 -bash
 sudo ./DELL_rate.sh
 sudo ./DELL_rate.sh
 /bin/bash ./DELL_rate.sh
 /bin/bash ./dell-run-main.sh rate
 /bin/bash ./dell-run-main.sh rate
 /bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1
   --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8 --output_format html,pdf,txt
 /bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1
   --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8 --output_format html,pdf,txt
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=64 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=32 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all --define DL-BIOS-SNC=4
   --define DL-LQC=1 --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1
   --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8 --output_format html,pdf,txt fprate
```

(Continued on next page)

Platform Notes (Continued)

```
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=64 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=32 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --define
   DL-BIOS-SNC=4 --define DL-LQC=1 --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define
   DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8 --output_format html,pdf,txt --nopower
   --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2023.0

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) Gold 6430
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b0004b1
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores       : 32
    siblings        : 64
    1 physical ids (chips)
    64 processors (hardware threads)
    physical id 0: core ids 0-31
    physical id 0: apicids 0-63
  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 6430
  CPU family:                      6
  Model:                           143
  Thread(s) per core:              2
  Core(s) per socket:              32
  Socket(s):                       1
  Stepping:                        8
  BogoMIPS:                        4200.00
  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 avx2 smep bmi2 erms invpcid 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
```

(Continued on next page)

Platform Notes (Continued)

```
                                  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 ibt amx_bf16
                                  avx512_fp16 amx_tile amx_int8 flush_l1d arch_capabilities
  L1d cache:                      1.5 MiB (32 instances)
  L1i cache:                      1 MiB (32 instances)
  L2 cache:                       64 MiB (32 instances)
  L3 cache:                       60 MiB (1 instance)
  NUMA node(s):                   4
  NUMA node0 CPU(s):              0,3,6,16,21,23,25,29,32,35,38,48,53,55,57,61
  NUMA node1 CPU(s):              1,4,10,14,20,24,27,31,33,36,42,46,52,56,59,63
  NUMA node2 CPU(s):              7,9,13,17,19,22,26,30,39,41,45,49,51,54,58,62
  NUMA node3 CPU(s):              2,5,8,11,12,15,18,28,34,37,40,43,44,47,50,60
  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
  Vulnerability Retbleed:         Not affected
  Vulnerability Spec rstack overflow: Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
  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     1.5M   12 Data            1    64        1             64
     L1i       32K       1M    8 Instruction     1    64        1             64
     L2         2M      64M   16 Unified         2  2048        1             64
     L3        60M      60M   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: 0,3,6,16,21,23,25,29,32,35,38,48,53,55,57,61
  node 0 size: 128656 MB
  node 0 free: 127865 MB
  node 1 cpus: 1,4,10,14,20,24,27,31,33,36,42,46,52,56,59,63
  node 1 size: 129019 MB
  node 1 free: 128317 MB
  node 2 cpus: 7,9,13,17,19,22,26,30,39,41,45,49,51,54,58,62
  node 2 size: 129019 MB
  node 2 free: 127904 MB
  node 3 cpus: 2,5,8,11-12,15,18,28,34,37,40,43-44,47,50,60
  node 3 size: 128963 MB
  node 3 free: 119654 MB
  node distances:
  node   0   1   2   3
    0:  10  12  12  12
    1:  12  10  12  12
    2:  12  12  10  12
    3:  12  12  12  10

------------------------------------------------------------
9. /proc/meminfo
```

(Continued on next page)

Platform Notes (Continued)

```
    MemTotal:       528036128 kB

------------------------------------------------------------
10. who -r
  run-level 3 Oct 11 10:16 last=5

------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.7)
  Default Target  Status
  graphical       running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE           UNIT FILES
  enabled         ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                  accounts-daemon anacron apparmor avahi-daemon bluetooth console-setup cron cups
                  cups-browsed dmesg e2scrub_reap getty@ gpu-manager grub-common grub-initrd-fallback
                  irqbalance kerneloops keyboard-setup networkd-dispatcher openvpn power-profiles-daemon
                  rsyslog secureboot-db setvtrgb snapd ssh switcheroo-control systemd-oomd systemd-pstore
                  systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw
                  unattended-upgrades wpa_supplicant
  enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
  disabled        acpid brltty console-getty debug-shell nftables openvpn-client@ openvpn-server@ openvpn@
                  rsync rtkit-daemon serial-getty@ speech-dispatcherd systemd-boot-check-no-failures
                  systemd-network-generator systemd-networkd systemd-networkd-wait-online systemd-sysext
                  systemd-time-wait-sync upower wpa_supplicant-nl80211@ wpa_supplicant-wired@
                  wpa_supplicant@
  generated       apport speech-dispatcher
  indirect        saned@ spice-vdagentd uuidd
  masked          alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
                  sudo x11-common

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.2.0-34-generic
  root=UUID=b08addc0-894d-435d-a619-c0fec2d4a2ec
  ro
  quiet
  splash
  vt.handoff=7

------------------------------------------------------------
14. 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
```

(Continued on next page)

Platform Notes (Continued)

```
  vm.watermark_scale_factor          10
  vm.zone_reclaim_mode                0

------------------------------------------------------------
15. /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

------------------------------------------------------------
16. /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

------------------------------------------------------------
17. OS release
  From /etc/*-release /etc/*-version
  os-release Ubuntu 22.04.2 LTS

------------------------------------------------------------
18. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2023.0
  Filesystem     Type   Size  Used Avail Use% Mounted on
  tmpfs          tmpfs   60G  4.2G   56G   7% /mnt/ramdisk

------------------------------------------------------------
19. /sys/devices/virtual/dmi/id
    Vendor:         Dell Inc.
    Product:        Precision 7960 Rack
    Product Family: Precision
    Serial:         31LXFZ3

------------------------------------------------------------
20. dmidecode
  Additional information from dmidecode 3.3 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 00AD00B300AD HMCG94AEBRA123N 64 GB 2 rank 4800, configured at 4400
    24x Not Specified Not Specified


------------------------------------------------------------
21. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       Dell Inc.
   BIOS Version:      1.5.6
   BIOS Date:         07/29/2023
   BIOS Revision:     1.5
```

Compiler Version Notes

```
==============================================================================================================
C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C          | 511.povray_r(base, peak) 526.blender_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

(Continued on next page)

Base Compiler Invocation (Continued)

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using both C and C++:
icpx icx

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

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

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops

(Continued on next page)

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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

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

Benchmarks using both C and C++:
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

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

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

(Continued on next page)

Peak Compiler Invocation (Continued)

Benchmarks using both C and C++:
icpx icx

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

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

(Continued on next page)

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_r: `basepeak = yes`

527.cam4_r: `basepeak = yes`

Benchmarks using both C and C++:

511.povray_r: `-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs`
`-fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX2`(pass 1)
`-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse`
`-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int`
`-mprefer-vector-width=512 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: `basepeak = yes`

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

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64_revB.2023-10-11.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64_revB.2023-10-11.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.xml`

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2023-10-11 14:54:29-0400.
Report generated on 2023-11-07 18:42:11 by CPU2017 PS formatter v6716.
Originally published on 2023-11-07.