SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R760 (Intel Xeon Gold 6430)

SPECrate®2017_int_base = 502

SPECrate®2017_int_peak = 518
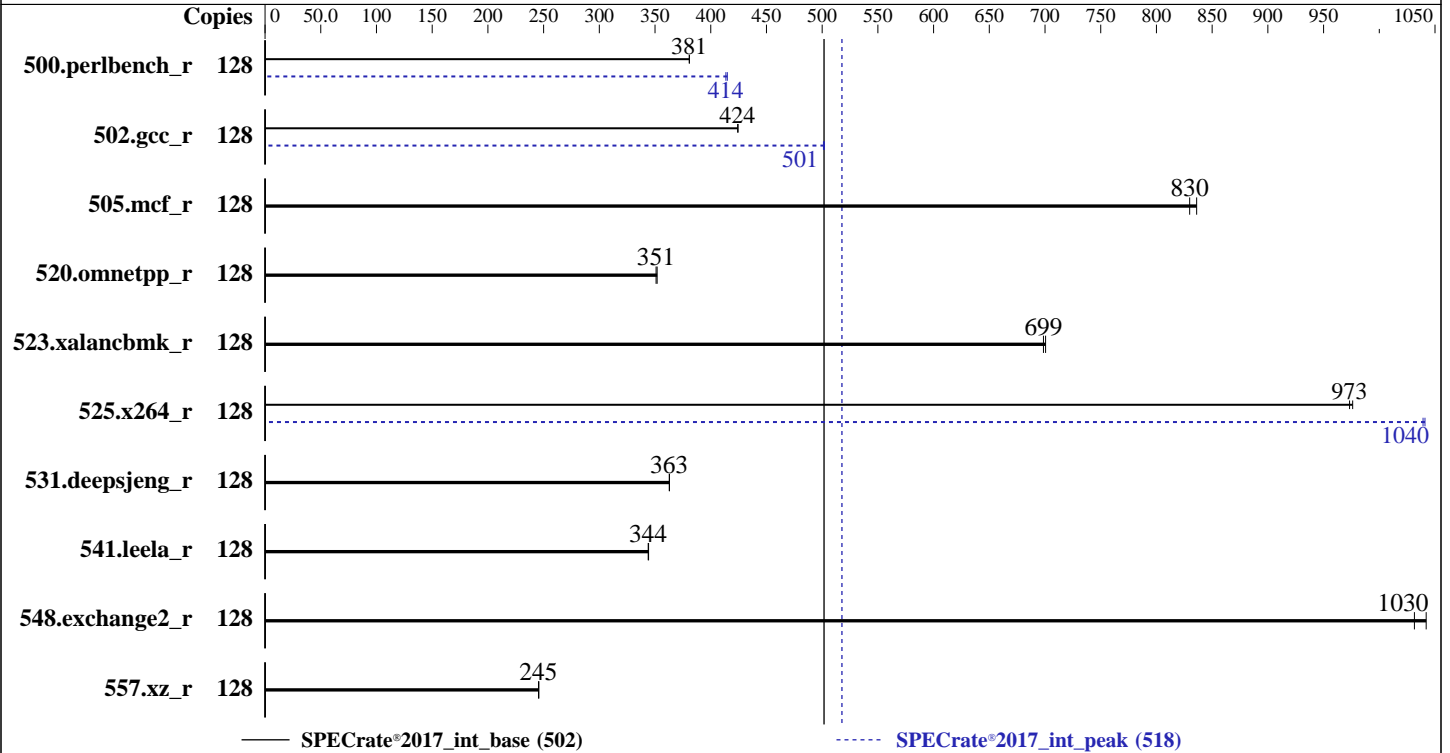
CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Copies		
500.perlbench_r	128	381 (base), 414 (peak)
502.gcc_r	128	424 (base), 501 (peak)
505.mcf_r	128	830
520.omnetpp_r	128	351
523.xalancbmk_r	128	699
525.x264_r	128	973 (base), 1040 (peak)
531.deepsjeng_r	128	363
541.leela_r	128	344
548.exchange2_r	128	1030
557.xz_r	128	245

SPECrate®2017_int_base (502) •••• SPECrate®2017_int_peak (518)

Hardware

CPU Name: Intel Xeon Gold 6430
 Max MHz: 3400
 Nominal: 2100
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 60 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-5600B-R, running at 4400)
Storage: 80 GB on tmpfs
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.2 (Plow)
 5.14.0-284.11.1.el9_2.x86_64
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 1.9.12 released Nov-2023
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-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							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	128	**535**	**381**	535	381			128	**493**	**414**	491	415		
502.gcc_r	128	427	425	**427**	**424**			128	**362**	**501**	361	502		
505.mcf_r	128	247	836	**249**	**830**			128	247	836	**249**	**830**		
520.omnetpp_r	128	477	352	**479**	**351**			128	477	352	**479**	**351**		
523.xalancbmk_r	128	193	701	**193**	**699**			128	193	701	**193**	**699**		
525.x264_r	128	230	976	**230**	**973**			128	**216**	**1040**	215	1040		
531.deepsjeng_r	128	**404**	**363**	404	363			128	**404**	**363**	404	363		
541.leela_r	128	616	344	**616**	**344**			128	616	344	**616**	**344**		
548.exchange2_r	128	**325**	**1030**	322	1040			128	**325**	**1030**	322	1040		
557.xz_r	128	**563**	**245**	562	246			128	**563**	**245**	562	246		

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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-ic2023.2.3/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2023.2.3/lib/ia32:/mnt
　　/ramdisk/cpu2017-1.1.9-ic2023.2.3/je5.0.1-32"
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
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

(Continued on next page)

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General Notes (Continued)

```
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 80 GB ramdisk created with the cmd: "mount -t tmpfs -o size=80G 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 : 2-way Clustering
                 LLC Prefetch : Disabled
          Dead Line LLC Alloc : Disabled

               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
               Optimizer Mode : Enabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2023.2.3/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Tue Apr  9 11:29:17 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 252 (252-13.el9_2)
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
```

(Continued on next page)

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Platform Notes (Continued)

```
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.localdomain 5.14.0-284.11.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 12 10:45:03 EDT
  2023 x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   11:29:17 up 1 min,  1 user,  load average: 0.26, 0.12, 0.04
  USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1       11:28   21.00s  1.19s  0.00s /bin/bash /home/DellFiles/bin/Intel/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=5.1 --output_format html,pdf,txt

------------------------------------------------------------
3. Username
  From environment variable $USER:  root

------------------------------------------------------------
4. ulimit -a
  real-time non-blocking time  (microseconds, -R) unlimited
  core file size              (blocks, -c) 0
  data seg size               (kbytes, -d) unlimited
  scheduling priority                 (-e) 0
  file size                   (blocks, -f) unlimited
  pending signals                     (-i) 4126034
  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) 4126034
  virtual memory              (kbytes, -v) unlimited
  file locks                          (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd rhgb cpu0_hotplug --switched-root --system --deserialize 31
 login -- root
 -bash
 /bin/bash ./DELL_rate.sh
 /bin/bash /home/DellFiles/bin/dell-run-main.sh rate
 /bin/bash /home/DellFiles/bin/dell-run-main.sh rate
 /bin/bash /home/DellFiles/bin/Intel/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=5.1 --output_format html,pdf,txt
 /bin/bash /home/DellFiles/bin/Intel/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=5.1 --output_format html,pdf,txt
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
   ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=64 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all --define DL-BIOS-SNC=2
```

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Platform Notes (Continued)

```
    --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1 --define
   DL-BIOS-adddcD=1 --define DL-VERS=5.1 --output_format html,pdf,txt intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
   ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=64 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --define
   DL-BIOS-SNC=2 --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1 --define
   DL-BIOS-adddcD=1 --define DL-VERS=5.1 --output_format html,pdf,txt --nopower --runmode rate --tune
   base:peak --size refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --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) Gold 6430
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 8
   microcode       : 0x2b000571
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   cpu cores       : 32
   siblings        : 64
   2 physical ids (chips)
   128 processors (hardware threads)
   physical id 0: core ids 0-31
   physical id 1: core ids 0-31
   physical id 0: apicids 0-63
   physical id 1: apicids 128-191
  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):                     128
  On-line CPU(s) list:        0-127
  Vendor ID:                  GenuineIntel
  BIOS Vendor ID:             Intel
  Model name:                 Intel(R) Xeon(R) Gold 6430
  BIOS 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):                  2
  Stepping:                   8
  CPU max MHz:                3400.0000
  CPU min MHz:                800.0000
  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
```

(Continued on next page)

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Platform Notes (Continued)

```
                              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 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:                  3 MiB (64 instances)
  L1i cache:                  2 MiB (64 instances)
  L2 cache:                   128 MiB (64 instances)
  L3 cache:                   120 MiB (2 instances)
  NUMA node(s):               4
  NUMA node0 CPU(s):          0,2,6,8,12,16,20,22,24,28,32,36,38,46,56,60,64,66,70,72,76,80,84,86,88,92,
                              96,100,102,110,120,124
  NUMA node1 CPU(s):          4,10,14,18,26,30,34,40,42,44,48,50,52,54,58,62,68,74,78,82,90,94,98,104,10
                              6,108,112,114,116,118,122,126
  NUMA node2 CPU(s):          1,3,5,7,15,19,25,29,33,39,47,51,57,59,61,63,65,67,69,71,79,83,89,93,97,103
                              ,111,115,121,123,125,127
  NUMA node3 CPU(s):          9,11,13,17,21,23,27,31,35,37,41,43,45,49,53,55,73,75,77,81,85,87,91,95,99,
                              101,105,107,109,113,117,119
  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
  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       3M   12 Data            1     64        1             64
      L1i       32K       2M    8 Instruction     1     64        1             64
      L2         2M     128M   16 Unified         2   2048        1             64
      L3        60M     120M   15 Unified         3  65536        1             64

  ------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
  node 0 cpus:
0,2,6,8,12,16,20,22,24,28,32,36,38,46,56,60,64,66,70,72,76,80,84,86,88,92,96,100,102,110,120,124
  node 0 size: 257493 MB
  node 0 free: 248447 MB
  node 1 cpus:
4,10,14,18,26,30,34,40,42,44,48,50,52,54,58,62,68,74,78,82,90,94,98,104,106,108,112,114,116,118,122,126
  node 1 size: 258001 MB
  node 1 free: 257157 MB
  node 2 cpus:
1,3,5,7,15,19,25,29,33,39,47,51,57,59,61,63,65,67,69,71,79,83,89,93,97,103,111,115,121,123,125,127
  node 2 size: 258040 MB
```

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Platform Notes (Continued)

```
   node 2 free: 257299 MB
   node 3 cpus:
   9,11,13,17,21,23,27,31,35,37,41,43,45,49,53,55,73,75,77,81,85,87,91,95,99,101,105,107,109,113,117,119
   node 3 size: 258035 MB
   node 3 free: 257289 MB
   node distances:
   node   0   1   2   3
     0:  10  12  21  21
     1:  12  10  21  21
     2:  21  21  10  12
     3:  21  21  12  10


   --------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1056329364 kB


   --------------------------------------------------------------
10. who -r
   run-level 3 Apr 9 11:28


   --------------------------------------------------------------
11. Systemd service manager version: systemd 252 (252-13.el9_2)
   Default Target  Status
   multi-user      running


   --------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                   accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker gdm
                   getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt
                   low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
                   nvmefc-boot-connections ostree-remount power-profiles-daemon qemu-guest-agent rhsmcertd
                   rsyslog rtkit-daemon selinux-autorelabel-mark smartd sshd sssd switcheroo-control
                   systemd-boot-update systemd-network-generator tuned udisks2 upower vgauthd vmtoolsd
   enabled-runtime systemd-remount-fs
   disabled        arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
                   canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed
                   dbus-daemon debug-shell dnf-system-upgrade dnsmasq firewalld hwloc-dump-hwdata iprdump
                   iprinit iprupdate iscsid iscsiuio kpatch kvm_stat ledmon man-db-restart-cache-update
                   nftables nvmf-autoconnect ostree-readonly-sysroot-migration podman podman-auto-update
                   podman-clean-transient podman-kube@ podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd
                   rhsm rhsm-facts rpmdb-rebuild selinux-check-proper-disable serial-getty@
                   speech-dispatcherd sshd-keygen@ systemd-boot-check-no-failures systemd-pstore
                   systemd-sysext wpa_supplicant
   indirect        spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo
                   systemd-sysupdate systemd-sysupdate-reboot

   --------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt5)/vmlinuz-5.14.0-284.11.1.el9_2.x86_64
   root=/dev/mapper/rhel-root
   ro
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap
   rhgb
   quiet
   cpu0_hotplug
```

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```
    ----------------------------------------------------------
    14. cpupower frequency-info
      analyzing CPU 0:
        current policy: frequency should be within 3.40 GHz and 3.40 GHz.
                        The governor "performance" may decide which speed to use
                        within this range.
        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                    40
      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
      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     Red Hat Enterprise Linux 9.2 (Plow)
      redhat-release Red Hat Enterprise Linux release 9.2 (Plow)
      system-release Red Hat Enterprise Linux release 9.2 (Plow)
```

Dell Inc.

PowerEdge R760 (Intel Xeon Gold 6430)

$SPECrate^{®}2017\_int\_base = 502$

$SPECrate^{®}2017\_int\_peak = 518$

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

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

Platform Notes (Continued)

```
        ----------------------------------------------------------
        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   80G  4.1G   76G   6% /mnt/ramdisk

        ----------------------------------------------------------
        21. /sys/devices/virtual/dmi/id
            Vendor:         Dell Inc.
            Product:        PowerEdge R760
            Product Family: PowerEdge
            Serial:         SLR7602

        ----------------------------------------------------------
        22. 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:
            16x 002C0632002C MTC40F2046S1RC56BG1 64 GB 2 rank 5600, configured at 4400


        ----------------------------------------------------------
        23. BIOS
        (This section combines info from /sys/devices and dmidecode.)
            BIOS Vendor:       Dell Inc.
            BIOS Version:      1.9.12
            BIOS Date:         11/10/2023
            BIOS Revision:     1.9
```

Compiler Version Notes

```
==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_r(base, peak)
------------------------------------------------------------------------------
```

(Continued on next page)

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Compiler Version Notes (Continued)

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------

==============================================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
         | 541.leela_r(base, peak)
------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------

==============================================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Base Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

SPEC CPU®2017 Integer Rate Result

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Dell Inc.

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Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Peak Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`

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Peak Portability Flags (Continued)

557.xz_r: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `-w -std=c11 -m64 -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`
`-fno-strict-overflow`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

502.gcc_r: `-m32`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/ia32_lin`
`-std=gnu89 -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`
`-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc`

505.mcf_r: `basepeak = yes`

525.x264_r: `-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-alias`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

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Dell Inc.

PowerEdge R760 (Intel Xeon Gold 6430)

SPECrate®2017_int_base = 502

SPECrate®2017_int_peak = 518

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

Peak Optimization Flags (Continued)

Fortran benchmarks:

  548.exchange2_r: basepeak = yes

The flags files that were used to format this result can be browsed at
  http://www.spec.org/cpu2017/flags/Intel-ic2023p2-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-ic2023p2-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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