SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6620 (Intel Xeon Platinum 8471N)

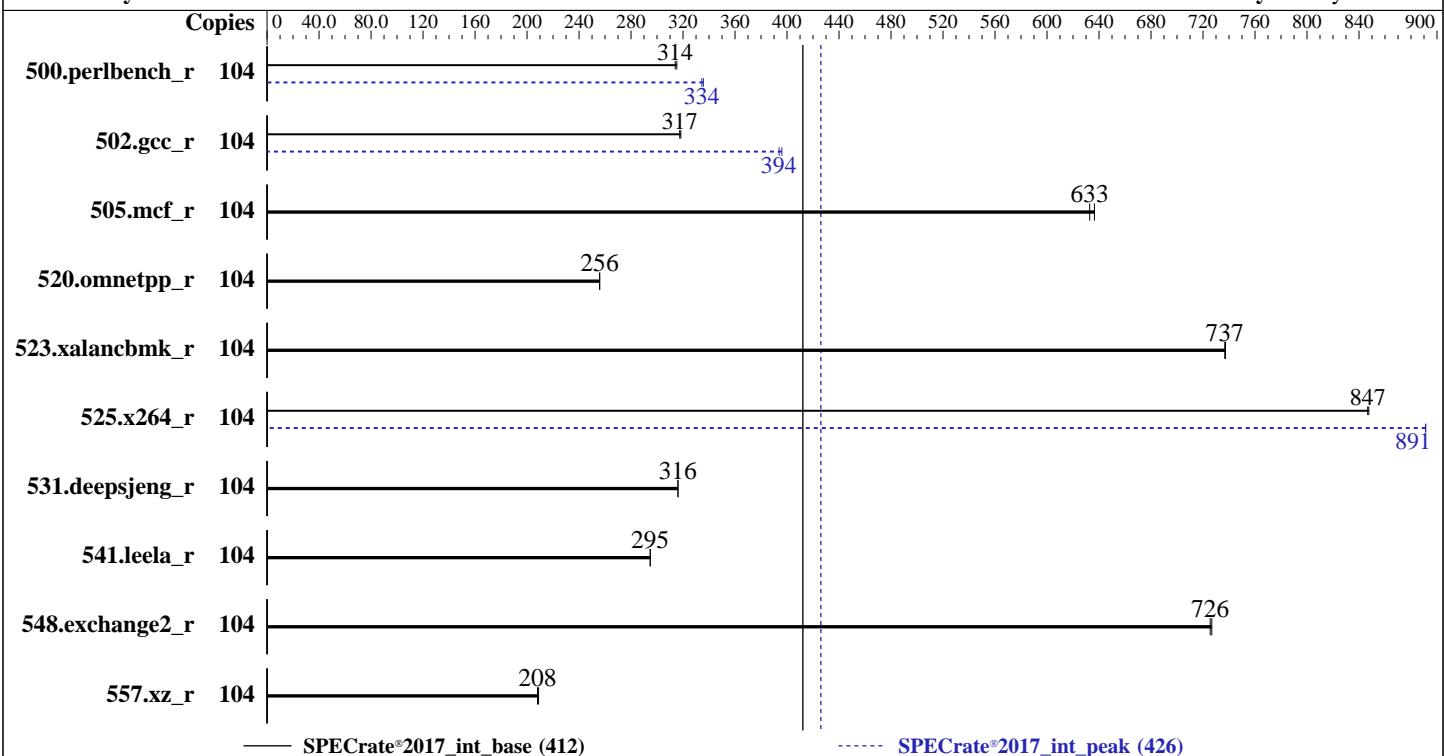$SPECrate^{®}2017\_int\_base = 412$

$SPECrate^{®}2017\_int\_peak = 426$

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

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: May-2022

Copies	
500.perlbench_r	104	314 / 334
502.gcc_r	104	317 / 394
505.mcf_r	104	633
520.omnetpp_r	104	256
523.xalancbmk_r	104	737
525.x264_r	104	847 / 891
531.deepsjeng_r	104	316
541.leela_r	104	295
548.exchange2_r	104	726
557.xz_r	104	208

SPECrate®2017_int_base (412)   SPECrate®2017_int_peak (426)

Hardware

CPU Name: Intel Xeon Platinum 8471N
 Max MHz: 3600
 Nominal: 1800
Enabled: 52 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: 97.5 MB I+D on chip per chip
 Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 125 GB on tmpfs
Other: None

Software

OS: Red Hat Enterprise Linux 8.6 (Ootpa)
 4.18.0-372.9.1.el8.x86_64
Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 0.3.1 released Nov-2022
File System: tmpfs
System State: Run level 5 (graphical 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.

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

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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	104	525	315	**527**	**314**			104	493	336	**495**	**334**		
502.gcc_r	104	463	318	**464**	**317**			104	372	396	**374**	**394**		
505.mcf_r	104	264	636	**266**	**633**			104	264	636	**266**	**633**		
520.omnetpp_r	104	**533**	**256**	533	256			104	**533**	**256**	533	256		
523.xalancbmk_r	104	**149**	**737**	149	737			104	**149**	**737**	149	737		
525.x264_r	104	215	848	**215**	**847**			104	**204**	**891**	204	891		
531.deepsjeng_r	104	**377**	**316**	377	316			104	**377**	**316**	377	316		
541.leela_r	104	**584**	**295**	584	295			104	**584**	**295**	584	295		
548.exchange2_r	104	375	727	**376**	**726**			104	375	727	**376**	**726**		
557.xz_r	104	**540**	**208**	538	209			104	**540**	**208**	538	209		

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

Compiler Notes

```
SPEC has ruled that the compiler used for this result was performing a compilation
that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s
benchmarks using a priori knowledge of the SPEC code and dataset to perform a
transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4
https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer
publish results using this optimization.

This result is left in the SPEC results database for historical reference.
```

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-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2022.1/lib/ia32:/mnt/ram
    disk/cpu2017-1.1.9-ic2022.1/je5.0.1-32"
MALLOC_CONF = "retain:true"
```

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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

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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"
```

Platform Notes

```
BIOS settings:
                ADDDC Setting : Disabled
        DIMM Self Healing on
  Uncorrectable Memory Error : Disabled
   Virtualization Technology : Disabled
            Sub NUMA Cluster : 4-way Clustering
    DCU Streamer Prefetcher : Disabled
                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-ic2022.1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on l Thu Jan 26 08:06:26 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
```

<div align="center">(Continued on next page)</div>

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Platform Notes (Continued)

```
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 239 (239-58.el8)
 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. tuned-adm active
 17. sysctl
 18. /sys/kernel/mm/transparent_hugepage
 19. /sys/kernel/mm/transparent_hugepage/khugepaged
 20. OS release
 21. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
 22. Disk information
 23. /sys/devices/virtual/dmi/id
 24. dmidecode
 25. BIOS
    ------------------------------------------------------------


    ------------------------------------------------------------
 1. uname -a
   Linux l 4.18.0-372.9.1.el8.x86_64 #1 SMP Fri Apr 15 22:12:19 EDT 2022 x86_64 x86_64 x86_64 GNU/Linux


    ------------------------------------------------------------
 2. w
    08:06:26 up 6 min,  1 user,  load average: 0.50, 0.56, 0.33
   USER     TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   donald   :1         :1               08:04   ?xdm?  12.86s  0.00s /usr/libexec/gdm-x-session
   --register-session --run-script gnome-session


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


    ------------------------------------------------------------
 4. ulimit -a
   core file size          (blocks, -c) 0
   data seg size           (kbytes, -d) unlimited
   scheduling priority             (-e) 0
   file size               (blocks, -f) unlimited
   pending signals                 (-i) 2060660
   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) 2060660
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited


    ------------------------------------------------------------
 5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 17
   /usr/lib/systemd/systemd --user
```

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Platform Notes (Continued)

```
 /usr/libexec/gnome-terminal-server
 bash
 sudo su
 su
 bash
 /bin/bash ./DELL_rate.sh
 /bin/bash ./dell-norun-main.sh rate
 /bin/bash ./dell-norun-main.sh rate
 /bin/bash ./dell-norun-specrate.sh --iterations 2 --output_format csv,html,pdf,txt --define
   Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc
 /bin/bash ./dell-norun-specrate.sh --iterations 2 --output_format csv,html,pdf,txt --define
   Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=104 -c
   ic2022.1-lin-core-avx512-rate-20220316.cfg --define smt-on --define cores=52 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all --iterations 2
   --output_format csv,html,pdf,txt --define Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=104 --configfile
   ic2022.1-lin-core-avx512-rate-20220316.cfg --define smt-on --define cores=52 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --iterations 2
   --output_format csv,html,pdf,txt --define Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --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-ic2022.1


 --------------------------------------------------------
 6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) Platinum 8471N
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b000111
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores       : 52
    siblings        : 104
    1 physical ids (chips)
    104 processors (hardware threads)
    physical id 0: core ids 0-51
    physical id 0: apicids 0-103
  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 2.32.1:
   Architecture:        x86_64
   CPU op-mode(s):      32-bit, 64-bit
   Byte Order:          Little Endian
   CPU(s):              104
   On-line CPU(s) list: 0-103
   Thread(s) per core:  2
   Core(s) per socket:  52
   Socket(s):           1
   NUMA node(s):        4
   Vendor ID:           GenuineIntel
   BIOS Vendor ID:      Intel
   CPU family:          6
   Model:               143
```

(Continued on next page)

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Platform Notes (Continued)

```
  Model name:            Intel(R) Xeon(R) Platinum 8471N
  BIOS Model name:       Intel(R) Xeon(R) Platinum 8471N
  Stepping:              8
  CPU MHz:               3514.016
  BogoMIPS:              3600.00
  L1d cache:             48K
  L1i cache:             32K
  L2 cache:              2048K
  L3 cache:              99840K
  NUMA node0 CPU(s):     0,2,4,6,8,10,12,14,16,18,20,22,24,52,54,56,58,60,62,64,66,68,70,72,74,76
  NUMA node1 CPU(s):     26,28,30,32,34,36,38,40,42,44,46,48,50,78,80,82,84,86,88,90,92,94,96,98,100,102
  NUMA node2 CPU(s):     1,3,5,7,9,11,13,15,17,19,21,23,25,53,55,57,59,61,63,65,67,69,71,73,75,77
  NUMA node3 CPU(s):     27,29,31,33,35,37,39,41,43,45,47,49,51,79,81,83,85,87,89,91,93,95,97,99,101,103
  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 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 flush_l1d arch_capabilities


  -----------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
  node 0 cpus: 0,2,4,6,8,10,12,14,16,18,20,22,24,52,54,56,58,60,62,64,66,68,70,72,74,76
  node 0 size: 128172 MB
  node 0 free: 125602 MB
  node 1 cpus: 26,28,30,32,34,36,38,40,42,44,46,48,50,78,80,82,84,86,88,90,92,94,96,98,100,102
  node 1 size: 129018 MB
  node 1 free: 126263 MB
  node 2 cpus: 1,3,5,7,9,11,13,15,17,19,21,23,25,53,55,57,59,61,63,65,67,69,71,73,75,77
  node 2 size: 129018 MB
  node 2 free: 126171 MB
  node 3 cpus: 27,29,31,33,35,37,39,41,43,45,47,49,51,79,81,83,85,87,89,91,93,95,97,99,101,103
  node 3 size: 129015 MB
  node 3 free: 126960 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
   MemTotal:       527589748 kB


  -----------------------------------------------------------
10. who -r
   run-level 5 Jan 26 08:02

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

(Continued on next page)

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Platform Notes (Continued)

```
11. Systemd service manager version: systemd 239 (239-58.el8)
  Default Target  Status
  graphical       degraded


  ----------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
    UNIT                        LOAD   ACTIVE SUB    DESCRIPTION
  * systemd-udev-settle.service loaded failed failed udev Wait for Complete Device Initialization


  ----------------------------------------------------------
13. Services, from systemctl list-unit-files
  STATE     UNIT FILES
  enabled   ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon
            atd auditd autovt@ avahi-daemon bluetooth chronyd crond cups display-manager firewalld gdm getty@
            import-state insights-client-boot irqbalance iscsi iscsi-onboot kdump ksm ksmtuned libstoragemgmt
            libvirtd loadmodules lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
            nvmefc-boot-connections ostree-remount qemu-guest-agent rhsmcertd rpcbind rsyslog rtkit-daemon
            selinux-autorelabel-mark smartd sshd sssd syslog timedatex tuned udisks2 vdo vgauthd vmtoolsd
  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
            debug-shell dnsmasq ebtables gssproxy hwloc-dump-hwdata initial-setup
            initial-setup-reconfiguration iprdump iprinit iprupdate iscsid iscsiuio kpatch kvm_stat ledmon
            libvirt-guests man-db-restart-cache-update ndctl-monitor netcf-transaction nfs-blkmap nfs-convert
            nfs-server nftables numad nvmf-autoconnect oddjobd podman podman-auto-update podman-restart
            psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts saslauthd serial-getty@ speech-dispatcherd
            sshd-keygen@ switcheroo-control systemd-nspawn@ systemd-resolved tcsd upower virtinterfaced
            virtnetworkd virtnodedevd virtnwfilterd virtproxyd virtqemud virtsecretd virtstoraged
            wpa_supplicant
  indirect  spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo virtlockd
            virtlogd
  masked    systemd-timedated


  ----------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=(hd0,gpt2)/vmlinuz-4.18.0-372.9.1.el8.x86_64
  root=/dev/mapper/rhel-root
  ro
  crashkernel=auto
  resume=/dev/mapper/rhel-swap
  rd.lvm.lv=rhel/root
  rd.lvm.lv=rhel/swap
  rhgb
  quiet


  ----------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
    Unable to determine current policy
    boost state support:
      Supported: yes
      Active: yes


  ----------------------------------------------------------
16. tuned-adm active
  Current active profile: throughput-performance


  ----------------------------------------------------------
17. sysctl
  kernel.numa_balancing          1
  kernel.randomize_va_space      2
```

(Continued on next page)

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Platform Notes (Continued)

```
   vm.compaction_proactiveness          0
   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


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


   ---------------------------------------------------------
19. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
   defrag                      1
   max_ptes_none             511
   max_ptes_swap              64
   pages_to_scan            4096
   scan_sleep_millisecs    10000


   ---------------------------------------------------------
20. OS release
   From /etc/*-release /etc/*-version
   os-release     Red Hat Enterprise Linux 8.6 (Ootpa)
   redhat-release Red Hat Enterprise Linux release 8.6 (Ootpa)
   system-release Red Hat Enterprise Linux release 8.6 (Ootpa)


   ---------------------------------------------------------
21. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
   itlb_multihit       Not affected
   l1tf                Not affected
   mds                 Not affected
   meltdown            Not affected
   spec_store_bypass   Mitigation: Speculative Store Bypass disabled via prctl and seccomp
   spectre_v1          Mitigation: usercopy/swapgs barriers and __user pointer sanitization
   spectre_v2          Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
   srbds               Not affected
   tsx_async_abort     Not affected
For more information, see the Linux documentation on hardware vulnerabilities, for example
     https://www.kernel.org/doc/html/latest/admin-guide/hw-vuln/index.html


   ---------------------------------------------------------
22. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2022.1
   Filesystem      Type   Size  Used Avail Use% Mounted on
   tmpfs           tmpfs  125G  3.7G  122G   3% /mnt/ramdisk
```

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Platform Notes (Continued)

```
    -------------------------------------------------------------
 23. /sys/devices/virtual/dmi/id
     Vendor:         Dell Inc.
     Product:        PowerEdge C6620
     Product Family: PowerEdge
     Serial:         SL6C201


    -------------------------------------------------------------
 24. 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 002C00B3002C MTC40F2046S1RC48BA1 64 GB 2 rank 4800


    -------------------------------------------------------------
 25. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:      Dell Inc.
   BIOS Version:     0.3.1
   BIOS Date:        11/24/2022
   BIOS Revision:    0.3
```

Compiler Version Notes

```
==========================================================================================================
C        | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------------------


==========================================================================================================
C        | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2022.1.0 Build 20220316
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----------------------------------------------------------------------------------------------------------


==========================================================================================================
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 2022.1.0 Build 20220316
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----------------------------------------------------------------------------------------------------------


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

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SPEC CPU®2017 Integer Rate Result

Dell Inc.

PowerEdge C6620 (Intel Xeon Platinum 8471N)

SPECrate®2017_int_base = 412

SPECrate®2017_int_peak = 426

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

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: May-2022

Compiler Version Notes (Continued)

```
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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------


=========================================================================================
Fortran | 548.exchange2_r(base, peak)
-----------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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`

Base Optimization Flags

C benchmarks:
`-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin`

(Continued on next page)

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

Dell Inc.

PowerEdge C6620 (Intel Xeon Platinum 8471N)

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CPU2017 License: 6573
Test Sponsor: Dell Inc.
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Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: May-2022

Base Optimization Flags (Continued)

C benchmarks (continued):
```
-lqkmalloc
```

C++ benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2022.1.0/linux/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`
557.xz_r: `-DSPEC_LP64`

Dell Inc.

PowerEdge C6620 (Intel Xeon Platinum 8471N)

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$SPECrate^{®}2017\_int\_peak = 426$

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Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: May-2022

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-AVX512`
`-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-strict-overflow`
`-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin`
`-lqkmalloc`

 502.gcc_r: `-m32`
`-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/ia32_lin`
`-std=gnu89 -Wl,-z,muldefs -fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX512`
`-Ofast -ffast-math -flto -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 -xCORE-AVX512 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-alias`
`-L/usr/local/intel/compiler/2022.1.0/linux/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`

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-ic2022-official-linux64-revB.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.html

SPEC CPU®2017 Integer Rate Result

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Dell Inc.

PowerEdge C6620 (Intel Xeon Platinum 8471N)

$SPECrate®2017\_int\_base = 412$

$SPECrate®2017\_int\_peak = 426$

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Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: May-2022

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64-revB.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.xml

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

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