SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

$SPECspeed®2017\_int\_base = 14.0$

PowerEdge HS5620 (Intel Xeon Silver 4416+)

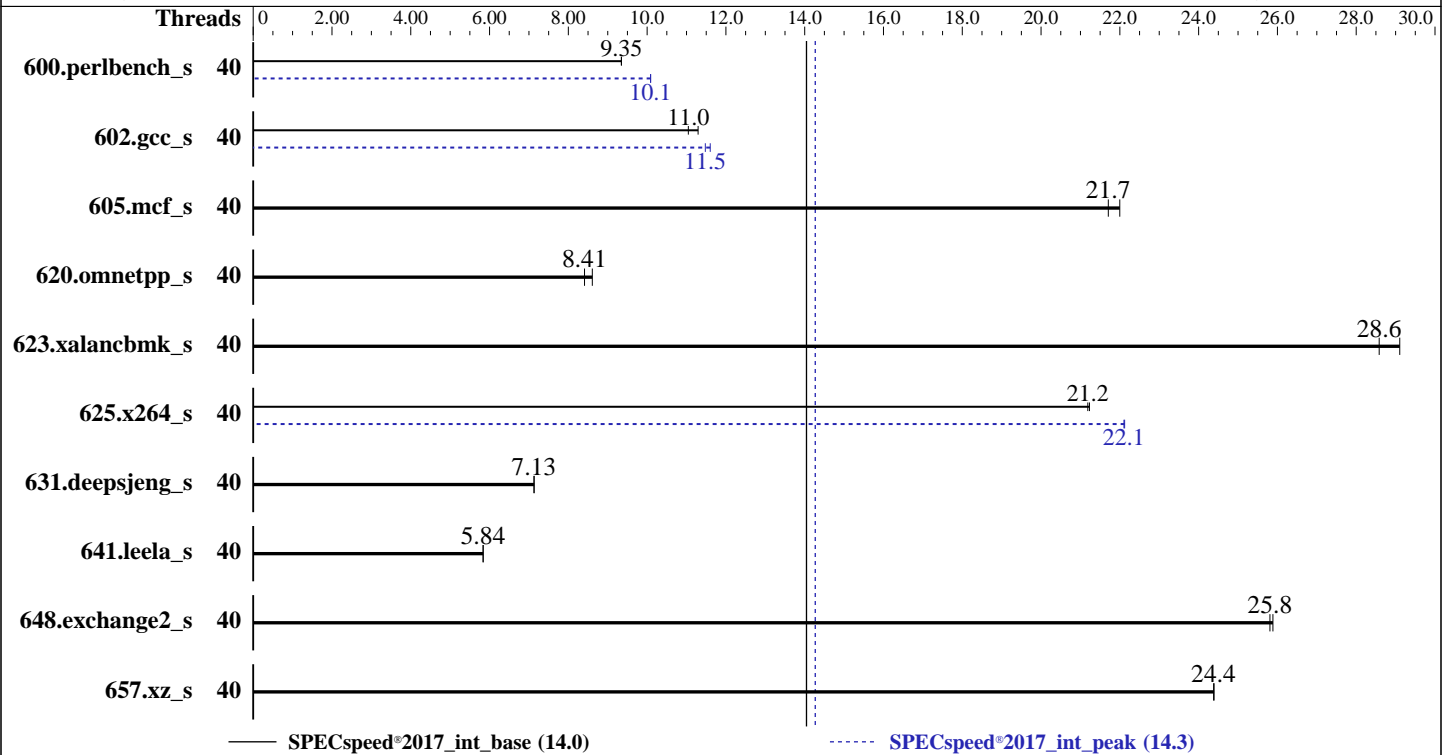$SPECspeed®2017\_int\_peak = 14.3$

CPU2017 License: 6573   **Test Date:** Mar-2023
Test Sponsor: Dell Inc.   **Hardware Availability:** Mar-2023
Tested by: Dell Inc.   **Software Availability:** Dec-2022

Threads

Benchmark	Threads	base	peak
600.perlbench_s	40	9.35	10.1
602.gcc_s	40	11.0	11.5
605.mcf_s	40	21.7	
620.omnetpp_s	40	8.41	
623.xalancbmk_s	40	28.6	
625.x264_s	40	21.2	22.1
631.deepsjeng_s	40	7.13	
641.leela_s	40	5.84	
648.exchange2_s	40	25.8	
657.xz_s	40	24.4	

SPECspeed®2017_int_base (14.0)   SPECspeed®2017_int_peak (14.3)

Hardware

CPU Name: Intel Xeon Silver 4416+
Max MHz: 3900
Nominal: 2000
Enabled: 40 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 37.5 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R, running at 4000)
Storage: 125 GB on tmpfs
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4
5.14.21-150400.22-default
Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 1.0.1 released Feb-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 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.3

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	40	**190**	**9.35**	190	9.35			40	176	10.1	**176**	**10.1**		
602.gcc_s	40	**360**	**11.0**	353	11.3			40	**347**	**11.5**	343	11.6		
605.mcf_s	40	**217**	**21.7**	215	22.0			40	**217**	**21.7**	215	22.0		
620.omnetpp_s	40	**194**	**8.41**	189	8.61			40	**194**	**8.41**	189	8.61		
623.xalancbmk_s	40	**49.6**	**28.6**	48.7	29.1			40	**49.6**	**28.6**	48.7	29.1		
625.x264_s	40	**83.3**	**21.2**	83.1	21.2			40	79.7	22.1	**79.8**	**22.1**		
631.deepsjeng_s	40	201	7.13	**201**	**7.13**			40	201	7.13	**201**	**7.13**		
641.leela_s	40	292	5.84	**292**	**5.84**			40	292	5.84	**292**	**5.84**		
648.exchange2_s	40	**114**	**25.8**	114	25.9			40	**114**	**25.8**	114	25.9		
657.xz_s	40	**254**	**24.4**	253	24.4			40	**254**	**24.4**	253	24.4		
SPECspeed®2017_int_base =		**14.0**												
SPECspeed®2017_int_peak =		**14.3**												

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.
```

Operating System Notes

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

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH =
    "/mnt/ramdisk/cpu2017-1.1.9-ic2023.0/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2023.0/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

General Notes

```
 Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
 memory using Redhat Enterprise Linux 8.0
 Transparent Huge Pages enabled by default
```

(Continued on next page)

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

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

$SPECspeed®2017\_int\_base = 14.0$

$SPECspeed®2017\_int\_peak = 14.3$

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

General Notes (Continued)

```
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>          /proc/sys/vm/drop_caches
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.

Benchmark run from a 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
            Logical Processor : Disabled
    Virtualization Technology : Disabled
              Sub NUMA Cluster : 2-way Clustering

                System Profile : Custom
        CPU Power Management : Maximum Performance
                          C1E : Disabled
                     C States : Autonomous
          Memory Patrol Scrub : Disabled
      Energy Efficiency Policy : Performance
            PCI ASPM L1 Link
              Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Wed Mar 22 21:55:24 2023

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

-----------------------------------------------------------
Table of contents
-----------------------------------------------------------
 1. uname -a
 2. w
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 8. numactl --hardware
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
```

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

$SPECspeed^{®}2017\_int\_base = 14.0$

$SPECspeed^{®}2017\_int\_peak = 14.3$

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2023

Hardware Availability: Mar-2023

Software Availability: Dec-2022

Platform Notes (Continued)

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


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


  -----------------------------------------------------------
  2. w
    21:55:24 up 17 min,  1 user,  load average: 15.72, 31.72, 24.25
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     -                21:38   17:32   0.96s  0.00s /bin/bash ./dell-run-specspeed.sh
    --iterations 2 --output_format csv,html,pdf,txt -define Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define
    Dell-BIOS-LogProcD=1


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


  -----------------------------------------------------------
  4. ulimit -a
    core file size          (blocks, -c) unlimited
    data seg size           (kbytes, -d) unlimited
    scheduling priority             (-e) 0
    file size               (blocks, -f) unlimited
    pending signals                 (-i) 4124668
    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) 4124668
    virtual memory          (kbytes, -v) unlimited
    file locks                      (-x) unlimited


  -----------------------------------------------------------
  5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 30
  login -- root
  -bash
  /bin/bash ./DELL_speed.sh
  /bin/bash ./dell-run-main.sh speed
  /bin/bash ./dell-run-main.sh speed
  /bin/bash ./dell-run-specspeed.sh --iterations 2 --output_format csv,html,pdf,txt -define
    Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1
  /bin/bash ./dell-run-specspeed.sh --iterations 2 --output_format csv,html,pdf,txt -define
    Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1
  runcpu --nobuild --action validate --define default-platform-flags -c
    ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=40 --tune base,peak -o all --define
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.3

CPU2017 License:	6573	**Test Date:**	Mar-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Mar-2023
Tested by:	Dell Inc.	**Software Availability:**	Dec-2022

Platform Notes (Continued)

```
    intspeedaffinity --define drop_caches --iterations 2 --output_format csv,html,pdf,txt -define
    Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1 intspeed
  runcpu --nobuild --action validate --define default-platform-flags --configfile
    ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=40 --tune base,peak --output_format all
    --define intspeedaffinity --define drop_caches --iterations 2 --output_format csv,html,pdf,txt --define
    Dell-BIOS-inc=Dell-BIOS_Xeon-4.inc --define Dell-BIOS-LogProcD=1 --nopower --runmode speed --tune
    base:peak --size refspeed intspeed --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.001/templogs/preenv.intspeed.001.0.log --lognum 001.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
 $SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2023.0

    --------------------------------------------------------------
6. /proc/cpuinfo
    model name       : Intel(R) Xeon(R) Silver 4416+
    vendor_id        : GenuineIntel
    cpu family       : 6
    model            : 143
    stepping         : 8
    microcode        : 0x2b000190
    bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores        : 20
    siblings         : 20
    2 physical ids (chips)
    40 processors (hardware threads)
    physical id 0: core ids 0-19
    physical id 1: core ids 0-19
    physical id 0: apicids 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38
    physical id 1: apicids 128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166
  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):                   40
  On-line CPU(s) list:      0-39
  Vendor ID:                GenuineIntel
  Model name:               Intel(R) Xeon(R) Silver 4416+
  CPU family:               6
  Model:                    143
  Thread(s) per core:       1
  Core(s) per socket:       20
  Socket(s):                2
  Stepping:                 8
  BogoMIPS:                 4000.00
  Flags:                    fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                            clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                            lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                            nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                            ds_cpl smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2
                            x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                            abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 invpcid_single
                            cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 hle
                            avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                            avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
```

(Continued on next page)

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.3

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Platform Notes (Continued)

```
                             xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                             cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                             arat pln pts avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes
                             vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid
                             bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear serialize
                             tsxldtrk pconfig arch_lbr avx512_fp16 amx_tile flush_l1d arch_capabilities
  L1d cache:                 1.9 MiB (40 instances)
  L1i cache:                 1.3 MiB (40 instances)
  L2 cache:                  80 MiB (40 instances)
  L3 cache:                  75 MiB (2 instances)
  NUMA node(s):              4
  NUMA node0 CPU(s):         0,4,8,12,16,20,24,28,32,36
  NUMA node1 CPU(s):         2,6,10,14,18,22,26,30,34,38
  NUMA node2 CPU(s):         1,5,9,13,17,21,25,29,33,37
  NUMA node3 CPU(s):         3,7,11,15,19,23,27,31,35,39
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
  Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:       Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
  Vulnerability Srbds:            Not affected
  Vulnerability Tsx async abort:  Not affected

From lscpu --cache:
    NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL  SETS PHY-LINE COHERENCY-SIZE
    L1d      48K     1.9M   12 Data            1    64      1            64
    L1i      32K     1.3M    8 Instruction     1    64      1            64
    L2        2M      80M   16 Unified         2  2048      1            64
    L3     37.5M      75M   15 Unified         3 40960      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: 0,4,8,12,16,20,24,28,32,36
  node 0 size: 257390 MB
  node 0 free: 256576 MB
  node 1 cpus: 2,6,10,14,18,22,26,30,34,38
  node 1 size: 258045 MB
  node 1 free: 257679 MB
  node 2 cpus: 1,5,9,13,17,21,25,29,33,37
  node 2 size: 258045 MB
  node 2 free: 257738 MB
  node 3 cpus: 3,7,11,15,19,23,27,31,35,39
  node 3 size: 257710 MB
  node 3 free: 248367 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:       1055940396 kB

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

(Continued on next page)

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.3

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Platform Notes (Continued)

```
 10. who -r
   run-level 3 Mar 22 21:38

   ----------------------------------------------------------
 11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
   Default Target  Status
   multi-user      running

   ----------------------------------------------------------
 12. Services, from systemctl list-unit-files
   STATE            UNIT FILES
   enabled          YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager
                    firewalld getty@ haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early
                    klog libvirtd lvm2-monitor nscd nvmefc-boot-connections oracle postfix purge-kernels
                    rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
                    wickedd-nanny xencommons
   enabled-runtime  systemd-remount-fs
   disabled         accounts-daemon amavis apache2 apache2@ appstream-sync-cache autofs autoyast-initscripts
                    bgpd blk-availability bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd
                    clamav-milter clamd console-getty cups cups-browsed ddclient debug-shell dhcpd dhcpd6
                    dhcrelay dhcrelay6 dirsrv@ dnsmasq ebtables exchange-bmc-os-info fetchmail freshclam gpm
                    grub2-once haveged-switch-root hwloc-dump-hwdata instsvcdrv ipmi ipmievd iscsi-init iscsid
                    iscsiuio isisd issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask
                    man-db-create mariadb mariadb@ multipathd named nfs nfs-blkmap nfs-server nfsserver nmb
                    nvmf-autoconnect ospf6d ospfd ostree-remount racoon racoon-setkey radvd rarpd@ rdisc ripd
                    ripngd rpcbind rpmconfigcheck rsyncd rtkit-daemon sapconf serial-getty@
                    smartd_generate_opts smb snmpd snmptrapd spamd spampd speech-dispatcherd squid srp_daemon
                    srp_daemon_port@ strongswan strongswan-starter svnserve sysstat
                    systemd-boot-check-no-failures systemd-network-generator systemd-nspawn@ systemd-sysext
                    systemd-time-wait-sync systemd-timesyncd tcsd udisks2 upower virtinterfaced virtnetworkd
                    virtnodedevd virtnwfilterd virtproxyd virtqemud virtsecretd virtstoraged virtxend vsftpd
                    winbind xen-dom0-modules xen-init-dom0 xen-qemu-dom0-disk-backend xen-watchdog xenconsoled
                    xendomains xenstored zebra
   indirect         pcscd uuidd virtlockd virtlogd wickedd

   ----------------------------------------------------------
 13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=1f8b0e1e-a49d-4ef6-8692-b2f5cea5eb27
   splash=silent
   mitigations=auto
   quiet
   security=apparmor
   crashkernel=315M,high
   crashkernel=72M,low

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

   ----------------------------------------------------------
 15. sysctl
   kernel.numa_balancing            1
   kernel.randomize_va_space        2
   vm.compaction_proactiveness      20
   vm.dirty_background_bytes        0
```

(Continued on next page)

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

$SPECspeed^{®}2017\_int\_base = 14.0$

$SPECspeed^{®}2017\_int\_peak = 14.3$

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Platform Notes (Continued)

```
   vm.dirty_background_ratio          10
   vm.dirty_bytes                      0
   vm.dirty_expire_centisecs        3000
   vm.dirty_ratio                     20
   vm.dirty_writeback_centisecs      500
   vm.dirtytime_expire_seconds     43200
   vm.extfrag_threshold              500
   vm.min_unmapped_ratio               1
   vm.nr_hugepages                     0
   vm.nr_hugepages_mempolicy           0
   vm.nr_overcommit_hugepages          0
   vm.swappiness                      20
   vm.watermark_boost_factor       15000
   vm.watermark_scale_factor          10
   vm.zone_reclaim_mode                0


   ----------------------------------------------------------
16. /sys/kernel/mm/transparent_hugepage
   defrag          always defer defer+madvise [madvise] never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force


   ----------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
   defrag                      1
   max_ptes_none             511
   max_ptes_shared           256
   max_ptes_swap              64
   pages_to_scan            4096
   scan_sleep_millisecs    10000


   ----------------------------------------------------------
18. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP4


   ----------------------------------------------------------
19. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2023.0
   Filesystem      Type   Size  Used Avail Use% Mounted on
   tmpfs           tmpfs  125G  4.3G  121G   4% /mnt/ramdisk


   ----------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:         Dell Inc.
    Product:        PowerEdge HS5620
    Product Family: PowerEdge
    Serial:         DULAC01


   ----------------------------------------------------------
21. dmidecode
   Additional information from dmidecode 3.2 follows.  WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
   "DMTF SMBIOS" standard.
   Memory:
     1x 00CE00B300CE M321R8GA0BB0-CQKDG 64 GB 2 rank 4800, configured at 4000
    11x 00CE00B300CE M321R8GA0BB0-CQKEG 64 GB 2 rank 4800, configured at 4000
```

(Continued on next page)

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

$SPECspeed^®2017\_int\_base = 14.0$

$SPECspeed^®2017\_int\_peak = 14.3$

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Platform Notes (Continued)

```
      2x 00CE063200CE M321R8GA0BB0-CQKMG 64 GB 2 rank 4800, configured at 4000
      2x 00CE069D00CE M321R8GA0BB0-CQKVE 64 GB 2 rank 4800, configured at 4000


    -----------------------------------------------------------
    22. BIOS
    (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:       Dell Inc.
      BIOS Version:      1.0.1
      BIOS Date:         02/13/2023
      BIOS Revision:     1.0
```

Compiler Version Notes

```
==============================================================================================
C        | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)
         | 657.xz_s(base, peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
C++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)
         | 641.leela_s(base, peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 648.exchange2_s(base, peak)
----------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.3

CPU2017 License: 6573　　　　　　　　　　　　　　　　　　　**Test Date:** Mar-2023
Test Sponsor: Dell Inc.　　　　　　　　　　　　　　　**Hardware Availability:** Mar-2023
Tested by: Dell Inc.　　　　　　　　　　　　　　　　**Software Availability:** Dec-2022

Base Portability Flags

600.perlbench_s: `-DSPEC_LP64 -DSPEC_LINUX_X64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`
623.xalancbmk_s: `-DSPEC_LP64 -DSPEC_LINUX`
625.x264_s: `-DSPEC_LP64`
631.deepsjeng_s: `-DSPEC_LP64`
641.leela_s: `-DSPEC_LP64`
648.exchange2_s: `-DSPEC_LP64`
657.xz_s: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
`-m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp`
`-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

C++ benchmarks:
`-m64 -std=c++14 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Fortran benchmarks:
`-m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-nostandard-realloc-lhs -align array32byte`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Peak Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.3

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

 600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
 -fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
 -flto -Ofast(pass 1) -xCORE-AVX512 -O3 -ffast-math
 -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
 -fiopenmp -DSPEC_OPENMP -fno-strict-overflow
 -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

 602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
 -fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
 -flto -Ofast(pass 1) -xCORE-AVX512 -O3 -ffast-math
 -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
 -fiopenmp -DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib
 -ljemalloc

 605.mcf_s: basepeak = yes

 625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -O3
 -ffast-math -flto -mfpmath=sse -funroll-loops
 -qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
 -fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

 657.xz_s: basepeak = yes

C++ benchmarks:

 620.omnetpp_s: basepeak = yes

 623.xalancbmk_s: basepeak = yes

 631.deepsjeng_s: basepeak = yes

 641.leela_s: basepeak = yes

Fortran benchmarks:

 648.exchange2_s: basepeak = yes

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

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge HS5620 (Intel Xeon Silver 4416+)

$SPECspeed®2017\_int\_base = 14.0$

$SPECspeed®2017\_int\_peak = 14.3$

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.xml

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 2023-03-22 09:55:24-0400.
Report generated on 2024-01-29 17:35:48 by CPU2017 PDF formatter v6716.
Originally published on 2023-04-26.