SPEC CPU®2017 Integer Speed Result

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Dell Inc.

PowerEdge R650 (Intel Xeon Platinum 8351N, 2.40 GHz)

$SPECspeed^{®}2017\_int\_base = 12.4$

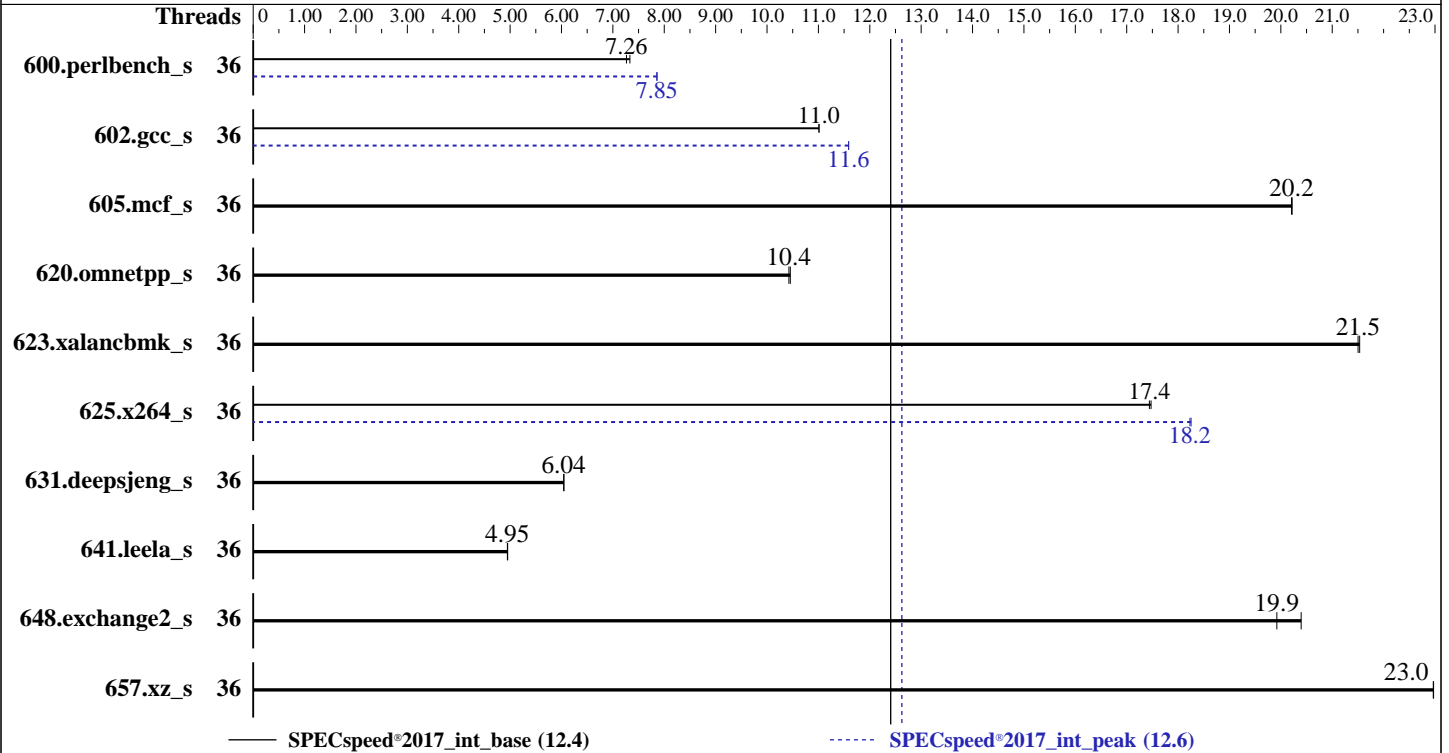$SPECspeed^{®}2017\_int\_peak = 12.6$

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

Test Date: May-2023
Hardware Availability: May-2021
Software Availability: Dec-2022

Threads

Benchmark	Threads	base	peak
600.perlbench_s	36	7.26	7.85
602.gcc_s	36	11.0	11.6
605.mcf_s	36	20.2	
620.omnetpp_s	36	10.4	
623.xalancbmk_s	36	21.5	
625.x264_s	36	17.4	18.2
631.deepsjeng_s	36	6.04	
641.leela_s	36	4.95	
648.exchange2_s	36	19.9	
657.xz_s	36	23.0	

—— $SPECspeed^{®}2017\_int\_base$ (12.4)   ⋯⋯ $SPECspeed^{®}2017\_int\_peak$ (12.6)

Hardware

CPU Name: Intel Xeon Platinum 8351N
 Max MHz: 3500
 Nominal: 2400
Enabled: 36 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1.25 MB I+D on chip per core
 L3: 54 MB I+D on chip per chip
 Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R, running at 2933)
Storage: 50 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 1.9.2 released Nov-2022
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.

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	36	**244**	**7.26**	242	7.33			36	226	7.86	**226**	**7.85**		
602.gcc_s	36	362	11.0	**362**	**11.0**			36	**344**	**11.6**	344	11.6		
605.mcf_s	36	**234**	**20.2**	233	20.2			36	**234**	**20.2**	233	20.2		
620.omnetpp_s	36	**156**	**10.4**	156	10.5			36	**156**	**10.4**	156	10.5		
623.xalancbmk_s	36	**65.9**	**21.5**	65.8	21.5			36	**65.9**	**21.5**	65.8	21.5		
625.x264_s	36	101	17.5	**101**	**17.4**			36	**96.8**	**18.2**	96.6	18.3		
631.deepsjeng_s	36	237	6.05	**237**	**6.04**			36	237	6.05	**237**	**6.04**		
641.leela_s	36	344	4.95	**345**	**4.95**			36	344	4.95	**345**	**4.95**		
648.exchange2_s	36	**148**	**19.9**	144	20.4			36	**148**	**19.9**	144	20.4		
657.xz_s	36	**269**	**23.0**	269	23.0			36	**269**	**23.0**	269	23.0		
SPECspeed®2017_int_base =		**12.4**												
SPECspeed®2017_int_peak =		**12.6**												

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)

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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 50 GB ramdisk created with the cmd: "mount -t tmpfs -o size=50G tmpfs /mnt/ramdisk"
```

Platform Notes

```
BIOS settings:
                    ADDDC Setting : Disabled
        DIMM Self Healing on
   Uncorrectable Memory Error : Disabled
            Logical Processor : Disabled
   Virtualization Technology : Disabled
               Optimizer Mode : Enabled

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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Wed May  3 21:27:45 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)

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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)
     x86_64 x86_64 x86_64 GNU/Linux


   ------------------------------------------------------------
   2. w
      21:27:45 up 11 min,  1 user,  load average: 0.30, 0.16, 0.15
      USER     TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
      root     tty1     -               21:27   33.00s  1.16s  0.00s /bin/bash ./dell-run-speccpu.sh speed
     --define DL-BIOSinc=Dell-BIOS_Xeon-3.inc --define DL-BIOS-LogProcD=1 --define DL-BIOS-adddcD=1 --define
     DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt


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


   ------------------------------------------------------------
   4. ulimit -a
     core file size          (blocks, -c) unlimited
     data seg size           (kbytes, -d) unlimited
     scheduling priority             (-e) 0
     file size               (blocks, -f) unlimited
     pending signals                 (-i) 2060328
     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) 2060328
     virtual memory          (kbytes, -v) unlimited
     file locks                      (-x) unlimited


   ------------------------------------------------------------
   5. sysinfo process ancestry
    /usr/lib/systemd/systemd --switched-root --system --deserialize 29
    login -- root
    -bash
    /bin/bash ./DELL_speed.sh
    /bin/bash ./dell-run-main.sh speed
    /bin/bash ./dell-run-main.sh speed
    /bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-3.inc --define DL-BIOS-LogProcD=1
      --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt
    /bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-3.inc --define DL-BIOS-LogProcD=1
      --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt
    runcpu --nobuild --action validate --define default-platform-flags -c
      ic2023.0-lin-core-avx512-speed-20221201.cfg --define cores=36 --tune base,peak -o all --define
```

(Continued on next page)

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Platform Notes (Continued)

```
      intspeedaffinity --define drop_caches --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-3.inc --define
      DL-BIOS-LogProcD=1 --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format csv,html,pdf,txt
      intspeed
   runcpu --nobuild --action validate --define default-platform-flags --configfile
      ic2023.0-lin-core-avx512-speed-20221201.cfg --define cores=36 --tune base,peak --output_format all
      --define intspeedaffinity --define drop_caches --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-3.inc
      --define DL-BIOS-LogProcD=1 --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --output_format
      csv,html,pdf,txt --nopower --runmode speed --tune base:peak --size refspeed 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) Platinum 8351N CPU @ 2.40GHz
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 106
    stepping        : 6
    microcode       : 0xd000389
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores       : 36
    siblings        : 36
    1 physical ids (chips)
    36 processors (hardware threads)
    physical id 0: core ids 0-35
    physical id 0: apicids
    0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70
  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):                    36
  On-line CPU(s) list:       0-35
  Vendor ID:                 GenuineIntel
  Model name:                Intel(R) Xeon(R) Platinum 8351N CPU @ 2.40GHz
  CPU family:                6
  Model:                     106
  Thread(s) per core:        1
  Core(s) per socket:        36
  Socket(s):                 1
  Stepping:                  6
  CPU max MHz:               3500.0000
  CPU min MHz:               800.0000
  BogoMIPS:                  4800.00
  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 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 invpcid_single intel_ppin ssbd mba
```

(Continued on next page)

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Platform Notes (Continued)

```
                             ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
                             erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
                             clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec
                             xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                             split_lock_detect wbnoinvd dtherm ida arat pln pts avx512vbmi umip pku
                             ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme
                             avx512_vpopcntdq la57 rdpid fsrm md_clear pconfig flush_l1d
                             arch_capabilities
  L1d cache:                 1.7 MiB (36 instances)
  L1i cache:                 1.1 MiB (36 instances)
  L2 cache:                  45 MiB (36 instances)
  L3 cache:                  54 MiB (1 instance)
  NUMA node(s):              1
  NUMA node0 CPU(s):         0-35
  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     1.7M   12 Data            1     64       1            64
     L1i      32K     1.1M    8 Instruction    1     64       1            64
     L2      1.3M      45M   20 Unified         2   1024       1            64
     L3       54M      54M   12 Unified         3  73728       1            64


  -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0-35
    node 0 size: 515104 MB
    node 0 free: 505550 MB
    node distances:
    node   0
      0:  10


  -----------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       527467240 kB


  -----------------------------------------------------------
  10. who -r
    run-level 3 May 3 21:16


  -----------------------------------------------------------
  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          apparmor auditd cron firewalld getty@ haveged irqbalance issue-generator kbdsettings
                     postfix purge-kernels rollback sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
```

(Continued on next page)

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Platform Notes (Continued)

```
                    wickedd-nanny
  enabled-runtime   systemd-remount-fs
  disabled          bmc-snmp-proxy boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell
                    ebtables exchange-bmc-os-info grub2-once haveged-switch-root ipmievd ipvsadm
                    issue-add-ssh-keys kexec-load lunmask netlabel racoon racoon-setkey rdisc rpmconfigcheck
                    rsyncd serial-getty@ snmpd snmptrapd systemd-boot-check-no-failures
                    systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd
  indirect          wickedd


------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
  root=UUID=0b46c224-29bd-4ee7-a1a0-fda5256c0c9a
  splash=silent
  mitigations=auto
  quiet
  security=apparmor


------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 3.50 GHz.
                    The governor "powersave" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes


------------------------------------------------------------
15. sysctl
  kernel.numa_balancing              0
  kernel.randomize_va_space          2
  vm.compaction_proactiveness       20
  vm.dirty_background_bytes          0
  vm.dirty_background_ratio         10
  vm.dirty_bytes                     0
  vm.dirty_expire_centisecs       3000
  vm.dirty_ratio                    20
  vm.dirty_writeback_centisecs     500
  vm.dirtytime_expire_seconds    43200
  vm.extfrag_threshold             500
  vm.min_unmapped_ratio              1
  vm.nr_hugepages                    0
  vm.nr_hugepages_mempolicy          0
  vm.nr_overcommit_hugepages         0
  vm.swappiness                     60
  vm.watermark_boost_factor      15000
  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
```

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Platform Notes (Continued)

```
   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   50G  4.2G   46G   9% /mnt/ramdisk


  --------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
     Vendor:         Dell Inc.
     Product:        PowerEdge R650
     Product Family: PowerEdge
     Serial:         DFLTSTG


  --------------------------------------------------------------
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:
    6x 00AD063200AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200, configured at 2933
    2x 00CE063200CE M393A8G40AB2-CWE 64 GB 2 rank 3200, configured at 2933


  --------------------------------------------------------------
22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:       Dell Inc.
     BIOS Version:      1.9.2
     BIOS Date:         11/17/2022
     BIOS Revision:     1.9
```

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
```

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Compiler Version Notes (Continued)

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

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

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 -xCORE-AVX512 -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 -xCORE-AVX512 -O3 -ffast-math -flto`

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Dell Inc.

PowerEdge R650 (Intel Xeon Platinum 8351N, 2.40 GHz)

SPECspeed®2017_int_base = 12.4

SPECspeed®2017_int_peak = 12.6

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

Test Date: May-2023
Hardware Availability: May-2021
Software Availability: Dec-2022

Base Optimization Flags (Continued)

C++ benchmarks (continued):
```
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:
```
-m64 -Wl,-z,muldefs -xCORE-AVX512 -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
```

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
```

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Peak Optimization Flags (Continued)

602.gcc_s (continued):
`-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 -xCORE-AVX512 -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`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.4.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.4.xml`

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

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