SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)
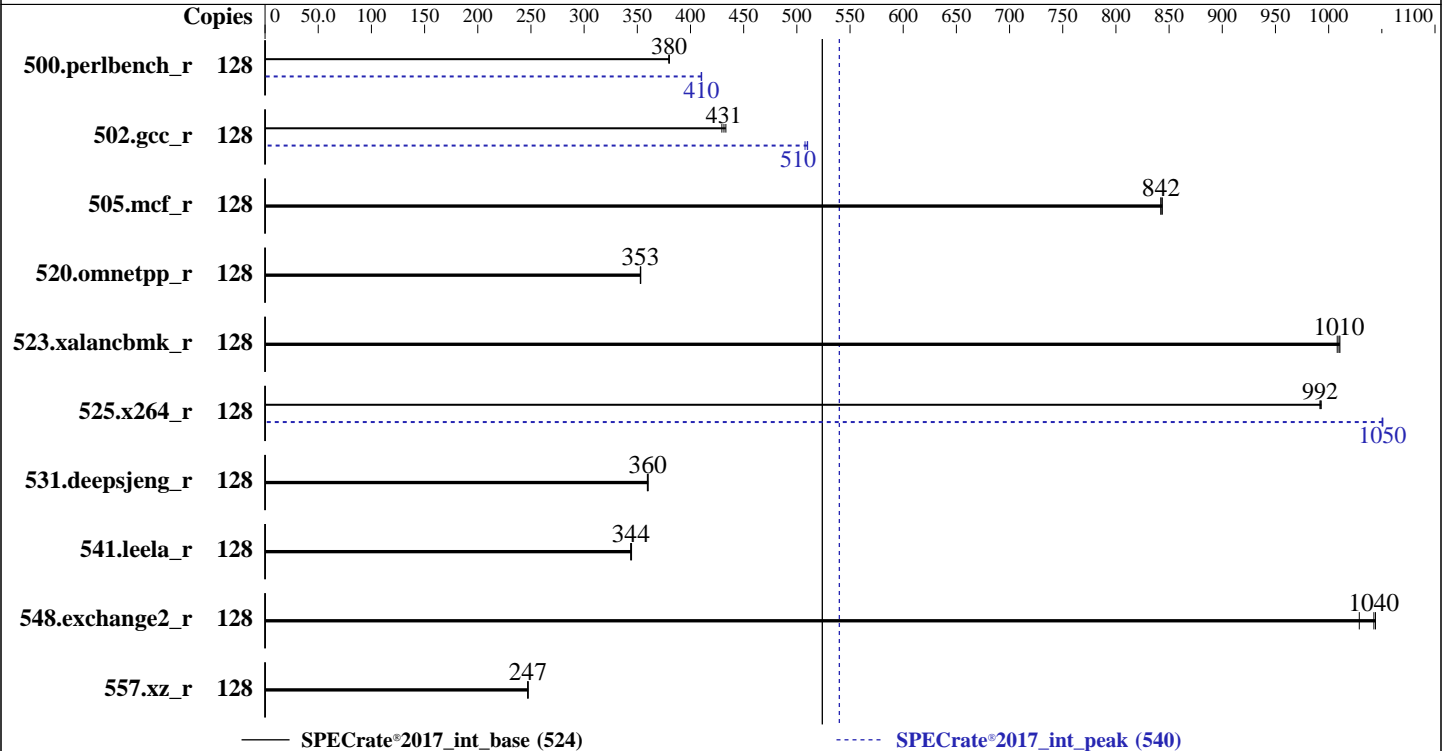
ProLiant DL380 Gen11
(2.10 GHz, Intel Xeon Gold 6430)

$SPECrate®2017\_int\_base = 524$

$SPECrate®2017\_int\_peak = 540$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

Benchmark	Copies	Base	Peak
500.perlbench_r	128	380	410
502.gcc_r	128	431	510
505.mcf_r	128	842	
520.omnetpp_r	128	353	
523.xalancbmk_r	128	1010	
525.x264_r	128	992	1050
531.deepsjeng_r	128	360	
541.leela_r	128	344	
548.exchange2_r	128	1040	
557.xz_r	128	247	

SPECrate®2017_int_base (524)   SPECrate®2017_int_peak (540)

Hardware

CPU Name: Intel Xeon Gold 6430

Max MHz: 3400

Nominal: 2100

Enabled: 64 cores, 2 chips, 2 threads/core

Orderable: 1, 2 chip(s)

Cache L1: 32 KB I + 48 KB D on chip per core

L2: 2 MB I+D on chip per core

L3: 60 MB I+D on chip per chip

Other: None

Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R, running at 4400)

Storage: 1 x 480 GB SATA SSD

Other: None

Software

OS: Red Hat Enterprise Linux release 9.0 (Plow) Kernel 5.14.0-70.13.1.el9_0.x86_64

Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2023.0 of Intel Fortran Compiler for Linux

Parallel: No

Firmware: HPE BIOS Version v1.40 05/18/2023 released May-2023

File System: xfs

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

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	128	**536**	**380**	537	380	536	380	128	497	410	496	411	**497**	**410**
502.gcc_r	128	422	430	418	433	**420**	**431**	128	357	508	355	510	**356**	**510**
505.mcf_r	128	246	842	**246**	**842**	245	844	128	246	842	**246**	**842**	245	844
520.omnetpp_r	128	**476**	**353**	476	353	475	353	128	**476**	**353**	476	353	475	353
523.xalancbmk_r	128	134	1010	134	1010	**134**	**1010**	128	134	1010	134	1010	**134**	**1010**
525.x264_r	128	**226**	**992**	226	992	226	993	128	213	1050	213	1050	**213**	**1050**
531.deepsjeng_r	128	408	359	**408**	**360**	407	360	128	408	359	**408**	**360**	407	360
541.leela_r	128	617	344	**616**	**344**	615	345	128	617	344	**616**	**344**	615	345
548.exchange2_r	128	326	1030	321	1040	**322**	**1040**	128	326	1030	321	1040	**322**	**1040**
557.xz_r	128	560	247	**559**	**247**	559	247	128	560	247	**559**	**247**	559	247
SPECrate®2017_int_base =		**524**												
SPECrate®2017_int_peak =		**540**												

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"
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>
IRQ balance service was stopped using "systemctl stop irqbalance.service"
tuned-adm profile was set to Accelerator-Performance using "tuned-adm profile accelerator-performance"
```

https://www.spec.org/

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/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 8.0
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.
 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
```

Platform Notes

```
The system ROM used for this result contains Intel microcode version 0x2b0004a1 for
the Intel Xeon Gold 6430 processor.
BIOS Configuration
 Workload Profile set to General Throughput Compute
 Memory Patrol Scrubbing set to Disabled
 Last Level Cache (LLC) Dead Line Allocation set to Disabled
 Intel UPI Link Enablement set to Single Link
 Enhanced Processor Performance Profile set to Aggressive
 Thermal Configuration set to Maximum Cooling
 Workload Profile set to Custom
   Adjacent Sector Prefetch set to Disabled
   DCU Stream Prefetcher set to Disabled
   Intel UPI Link Power Management set to Enabled
   Minimum Processor Idle Power Package C-State set to Package C6 (non-retention) State

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Thu Jun  8 12:03:43 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 250 (250-6.el9_0)
 12. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
```

(Continued on next page)

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Platform Notes (Continued)

```
 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. Disk information
 22. /sys/devices/virtual/dmi/id
 23. dmidecode
 24. BIOS
    -----------------------------------------------------------


    -----------------------------------------------------------
 1. uname -a
   Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64
   x86_64 x86_64 GNU/Linux


    -----------------------------------------------------------
 2. w
    12:03:43 up 0 min,  0 users,  load average: 1.69, 0.62, 0.22
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT

    -----------------------------------------------------------
 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) 2062699
   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) 2062699
   virtual memory              (kbytes, -v) unlimited
   file locks                         (-x) unlimited

    -----------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 27
  sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
  sshd: root [priv]
  sshd: root@notty
  bash -c cd $SPEC/ && $SPEC/intrate_spr.sh
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
    --define invoke_with_interleave --define drop_caches --tune base,peak -o all intrate
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
    --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
```

(Continued on next page)

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Platform Notes (Continued)

```
   --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 = /home/cpu2017


----------------------------------------------------------
6. /proc/cpuinfo
    model name        : Intel(R) Xeon(R) Gold 6430
    vendor_id         : GenuineIntel
    cpu family        : 6
    model             : 143
    stepping          : 6
    microcode         : 0x2b0004a1
    bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs
    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(R) Corporation
  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:               6
  BogoMIPS:               3800.00
  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 vmx 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 tpr_shadow
                          vnmi flexpriority ept vpid ept_ad 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
```

(Continued on next page)

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Platform Notes (Continued)

```
                            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
  Virtualization:           VT-x
  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):             8
  NUMA node0 CPU(s):        0-7,64-71
  NUMA node1 CPU(s):        8-15,72-79
  NUMA node2 CPU(s):        16-23,80-87
  NUMA node3 CPU(s):        24-31,88-95
  NUMA node4 CPU(s):        32-39,96-103
  NUMA node5 CPU(s):        40-47,104-111
  NUMA node6 CPU(s):        48-55,112-119
  NUMA node7 CPU(s):        56-63,120-127
  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
  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      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: 8 nodes (0-7)
  node 0 cpus: 0-7,64-71
  node 0 size: 64202 MB
  node 0 free: 63627 MB
  node 1 cpus: 8-15,72-79
  node 1 size: 64508 MB
  node 1 free: 64077 MB
  node 2 cpus: 16-23,80-87
  node 2 size: 64508 MB
  node 2 free: 64141 MB
  node 3 cpus: 24-31,88-95
  node 3 size: 64508 MB
  node 3 free: 64201 MB
  node 4 cpus: 32-39,96-103
  node 4 size: 64508 MB
  node 4 free: 64229 MB
  node 5 cpus: 40-47,104-111
  node 5 size: 64508 MB
  node 5 free: 64046 MB
  node 6 cpus: 48-55,112-119
  node 6 size: 64508 MB
  node 6 free: 64230 MB
  node 7 cpus: 56-63,120-127
```

(Continued on next page)

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Platform Notes (Continued)

```
   node 7 size: 64461 MB
   node 7 free: 64169 MB
   node distances:
   node   0    1    2    3    4    5    6    7
     0:  10   20   30   30   30   30   30   30
     1:  20   10   30   30   30   30   30   30
     2:  30   30   10   20   30   30   30   30
     3:  30   30   20   10   30   30   30   30
     4:  30   30   30   30   10   20   30   30
     5:  30   30   30   30   20   10   30   30
     6:  30   30   30   30   30   30   10   20
     7:  30   30   30   30   30   30   20   10


  ------------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       528091484 kB


  ------------------------------------------------------------
  10. who -r
    run-level 3 Jun 8 12:02


  ------------------------------------------------------------
  11. Systemd service manager version: systemd 250 (250-6.el9_0)
    Default Target  Status
    multi-user      degraded


  ------------------------------------------------------------
  12. Failed units, from systemctl list-units --state=failed
      UNIT          LOAD   ACTIVE SUB    DESCRIPTION
    * sep5.service loaded failed failed systemd script to load sep5 driver at boot time


  ------------------------------------------------------------
  13. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
                     dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
                     nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sep5 sshd sssd
                     systemd-network-generator tuned udisks2 upower
    enabled-runtime  systemd-remount-fs
    disabled         blk-availability canberra-system-bootup canberra-system-shutdown
                     canberra-system-shutdown-reboot chrony-wait chronyd console-getty cpupower debug-shell
                     hwloc-dump-hwdata ipsec kvm_stat man-db-restart-cache-update nftables powertop rdisc rhsm
                     rhsm-facts rpmdb-rebuild serial-getty@ sshd-keygen@ systemd-boot-check-no-failures
                     systemd-pstore systemd-sysext
    indirect         sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

  ------------------------------------------------------------
  14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
    root=/dev/mapper/rhel-root
    ro
    resume=/dev/mapper/rhel-swap
    rd.lvm.lv=rhel/root
    rd.lvm.lv=rhel/swap


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

(Continued on next page)

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Platform Notes (Continued)

```
        Supported: yes
        Active: yes


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


    ------------------------------------------------------------
    17. 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


    ------------------------------------------------------------
    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_shared           256
      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 9.0 (Plow)
      redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
      system-release Red Hat Enterprise Linux release 9.0 (Plow)


    ------------------------------------------------------------
    21. Disk information
    SPEC is set to: /home/cpu2017
      Filesystem            Type  Size  Used Avail Use% Mounted on
      /dev/mapper/rhel-home xfs   372G  112G  260G  31% /home


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

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Platform Notes (Continued)

```
 22. /sys/devices/virtual/dmi/id
       Vendor:         HPE
       Product:        ProLiant DL380 Gen11
       Product Family: ProLiant
       Serial:         CNX21000G8


     ----------------------------------------------------------------
 23. 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:
       1x Hynix HMCG88AEBRA168N 32 GB 2 rank 4800, configured at 4400
      15x Hynix HMCG88MEBRA113N 32 GB 2 rank 4800, configured at 4400


     ----------------------------------------------------------------
 24. BIOS
     (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:       HPE
       BIOS Version:      1.40
       BIOS Date:         05/18/2023
       BIOS Revision:     1.40
       Firmware Revision: 1.10
```

Compiler Version Notes

```
==============================================================================================
C        | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201
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 2023.0.0 Build 20221201
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----------------------------------------------------------------------------------------------


==============================================================================================
C        | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201
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 2023.0.0 Build 20221201
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----------------------------------------------------------------------------------------------


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

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL380 Gen11
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_int_base = 524

SPECrate®2017_int_peak = 540

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Jun-2023
Hardware Availability: May-2023
Software Availability: Dec-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 2023.0.0 Build 20221201
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 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`

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 -xsapphirerapids -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin`

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL380 Gen11
(2.10 GHz, Intel Xeon Gold 6430)

$SPECrate^{®}2017\_int\_base = 524$

$SPECrate^{®}2017\_int\_peak = 540$

CPU2017 License:	3		**Test Date:**	Jun-2023
Test Sponsor:	HPE		**Hardware Availability:**	May-2023
Tested by:	HPE		**Software Availability:**	Dec-2022

Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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/usr/local/intel/compiler/2023.0.0/linux/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/usr/local/intel/compiler/2023.0.0/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`

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

SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL380 Gen11
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_int_base = 524

SPECrate®2017_int_peak = 540

CPU2017 License: 3	**Test Date:** Jun-2023
Test Sponsor: HPE	**Hardware Availability:** May-2023
Tested by: HPE	**Software Availability:** Dec-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-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

```
502.gcc_r: -m32
-L/usr/local/intel/compiler/2023.0.0/linux/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/usr/local/intel/compiler/2023.0.0/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
```

SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL380 Gen11
(2.10 GHz, Intel Xeon Gold 6430)

SPECrate®2017_int_base = 524

SPECrate®2017_int_peak = 540

CPU2017 License: 3		**Test Date:**	Jun-2023
Test Sponsor:	HPE	**Hardware Availability:**	May-2023
Tested by:	HPE	**Software Availability:**	Dec-2022

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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev2.1.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev2.1.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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

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