# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)
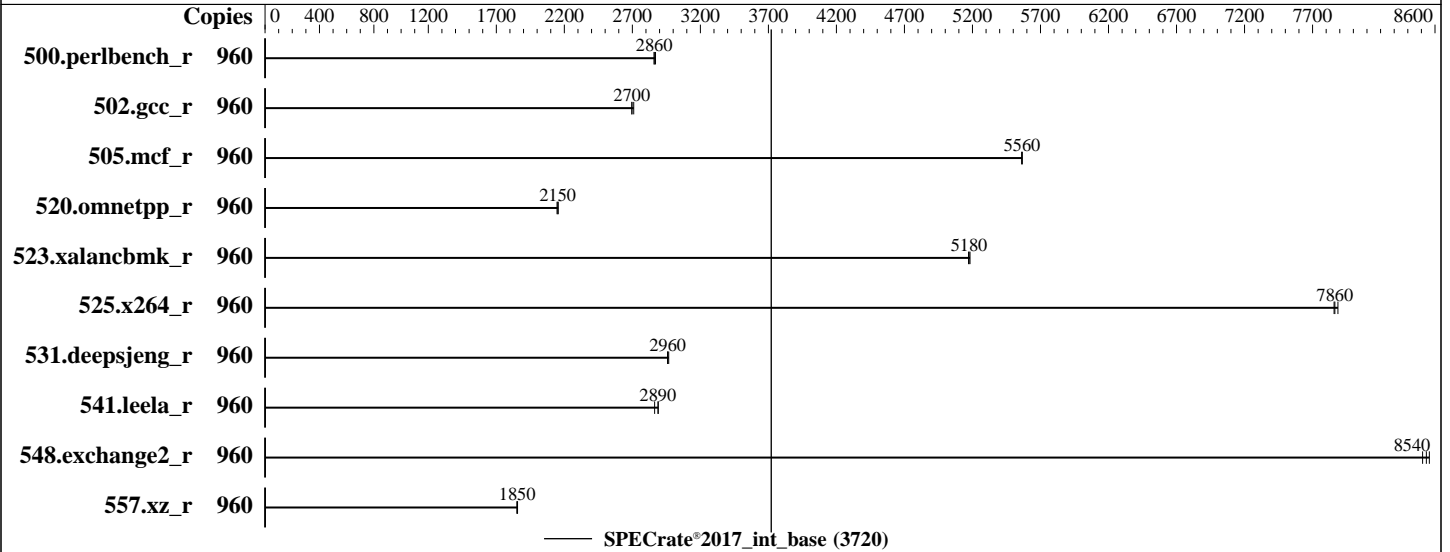
HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

$SPECrate®2017\_int\_base =$    3720

$SPECrate®2017\_int\_peak =$ Not Run

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Jan-2024

**Hardware Availability:** Dec-2023

**Software Availability:** Dec-2023

**Copies**

| Benchmark | Copies | Result |
|---|---|---|
| 500.perlbench_r | 960 | 2860 |
| 502.gcc_r | 960 | 2700 |
| 505.mcf_r | 960 | 5560 |
| 520.omnetpp_r | 960 | 2150 |
| 523.xalancbmk_r | 960 | 5180 |
| 525.x264_r | 960 | 7860 |
| 531.deepsjeng_r | 960 | 2960 |
| 541.leela_r | 960 | 2890 |
| 548.exchange2_r | 960 | 8540 |
| 557.xz_r | 960 | 1850 |

SPECrate®2017_int_base (3720)

## Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
Enabled: 480 cores, 8 chips, 2 threads/core
Orderable: 4, 8, 16 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 112.5 MB I+D on chip per chip
 Other: None
Memory: 4 TB (64 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 6.4 TB NVMe SSD
Other: None

## Software

OS: Red Hat Enterprise Linux 8.8 (Ootpa)
 Kernel 4.18.0-477.10.1.el8_8.x86_64
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: HPE Firmware Bundle Version 1.10.342 released Dec-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: HPE Foundation Software 2.5.0
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/

# SPEC CPU®2017 Integer Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise
(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 3720

SPECrate®2017_int_peak = Not Run

| | |
|---|---|
| **CPU2017 License:** 3 | **Test Date:** Jan-2024 |
| **Test Sponsor:** HPE | **Hardware Availability:** Dec-2023 |
| **Tested by:** HPE | **Software Availability:** Dec-2023 |

## Results Table

| Benchmark | Base Copies | Base Seconds | Base Ratio | Base Seconds | Base Ratio | Base Seconds | Base Ratio | Peak Copies | Peak Seconds | Peak Ratio | Peak Seconds | Peak Ratio | Peak Seconds | Peak Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 500.perlbench_r | 960 | 534 | 2860 | **534** | **2860** | 532 | 2870 | | | | | | | |
| 502.gcc_r | 960 | 504 | 2700 | 502 | 2710 | **504** | **2700** | | | | | | | |
| 505.mcf_r | 960 | 279 | 5560 | **279** | **5560** | 279 | 5570 | | | | | | | |
| 520.omnetpp_r | 960 | 584 | 2150 | **585** | **2150** | 587 | 2150 | | | | | | | |
| 523.xalancbmk_r | 960 | 196 | 5170 | **196** | **5180** | 196 | 5180 | | | | | | | |
| 525.x264_r | 960 | 214 | 7860 | **214** | **7860** | 213 | 7890 | | | | | | | |
| 531.deepsjeng_r | 960 | 371 | 2970 | **372** | **2960** | 372 | 2960 | | | | | | | |
| 541.leela_r | 960 | 555 | 2860 | **550** | **2890** | 550 | 2890 | | | | | | | |
| 548.exchange2_r | 960 | **295** | **8540** | 296 | 8510 | 294 | 8560 | | | | | | | |
| 557.xz_r | 960 | **559** | **1850** | 559 | 1860 | 560 | 1850 | | | | | | | |

**SPECrate®2017_int_base =** 3720

**SPECrate®2017_int_peak =** **Not Run**

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.

## Operating System Notes

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

## 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 8.4
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.

**(Continued on next page)**

# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

$SPECrate®2017\_int\_base =$      3720

$SPECrate®2017\_int\_peak =$ Not Run

| | |
|---|---|
| **CPU2017 License:** 3 | **Test Date:** Jan-2024 |
| **Test Sponsor:** HPE | **Hardware Availability:** Dec-2023 |
| **Tested by:** HPE | **Software Availability:** Dec-2023 |

## General Notes (Continued)

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.

## Platform Notes

```
The system ROM used for this result contains Intel microcode version 0x2b0004d0 for
the Intel Xeon Platinum 8490H processor.
BIOS Configuration:
 Workload Profile set to Custom
 Energy/Performance Bias set to Maximum Performance
 Energy Efficient Turbo set to Disabled
 Advanced Memory Protection set to Advanced ECC Support
 SR-IOV set to Disabled
 Intel Virtualization Technology (Intel VT, VT-x) set to Disabled
 Adjacent Sector Prefetch set to Disabled
 DCU Stream Prefetcher set to Disabled
 Last Level Cache (LLC) Dead Line Allocation set to Disabled
 Enhanced Processor Performance Profile set to Aggressive
 Memory Patrol Scrubbing set to Disabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on sph-201 Thu Jan 18 23:36:11 2024

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

 ---------------------------------------------------------
 Table of contents
 ---------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 239 (239-74.el8_8)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
 21. Disk information
 22. /sys/devices/virtual/dmi/id
 23. dmidecode
 24. BIOS
 ---------------------------------------------------------

 ---------------------------------------------------------
  1. uname -a
    Linux sph-201 4.18.0-477.10.1.el8_8.x86_64 #1 SMP Wed Apr 5 13:35:01 EDT 2023 x86_64 x86_64 x86_64
    GNU/Linux
```

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

$SPECrate®2017\_int\_base =$ 3720

$SPECrate®2017\_int\_peak =$ Not Run

## Platform Notes (Continued)

```
    -----------------------------------------------------------
    2. w
       23:36:11 up 3 min,  2 users,  load average: 2.22, 3.52, 1.63
      USER     TTY        FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
      test     ttyS0      -               23:33   10.00s  1.23s  0.02s login -- test
      test     pts/0      10.3.218.129    23:34    1:39   0.03s  0.02s sshd: test [priv]

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


    -----------------------------------------------------------
    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) 16249854
      max locked memory       (kbytes, -l) 64
      max memory size         (kbytes, -m) unlimited
      open files                      (-n) 40000
      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) 16249854
      virtual memory          (kbytes, -v) unlimited
      file locks                      (-x) unlimited


    -----------------------------------------------------------
    5. sysinfo process ancestry
     /usr/lib/systemd/systemd --switched-root --system --deserialize 18
     login -- test
     -bash
     sudo su
     su
     bash
     bash
     runcpu --nobuild --action validate --define default-platform-flags --define numcopies=960 -c
       ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=480 --define physicalfirst
       --define invoke_with_interleave --define drop_caches --tune base -o all intrate
     runcpu --nobuild --action validate --define default-platform-flags --define numcopies=960 --configfile
       ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=480 --define physicalfirst
       --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
       rate --tune base --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) Platinum 8490H
        vendor_id       : GenuineIntel
        cpu family      : 6
        model           : 143
        stepping        : 8
        microcode       : 0x2b0004d0
```

**(Continued on next page)**

## Hewlett Packard Enterprise
(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =     3720

SPECrate®2017_int_peak = Not Run

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

**Test Date:**             Jan-2024
**Hardware Availability:** Dec-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

```
    bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores        : 60
    siblings         : 120
    8 physical ids (chips)
    960 processors (hardware threads)
    physical id 0: core ids 0-59
    physical id 1: core ids 0-59
    physical id 2: core ids 0-59
    physical id 3: core ids 0-59
    physical id 4: core ids 0-59
    physical id 5: core ids 0-59
    physical id 6: core ids 0-59
    physical id 7: core ids 0-59
    physical id 0: apicids 0-119
    physical id 1: apicids 128-247
    physical id 2: apicids 256-375
    physical id 3: apicids 384-503
    physical id 4: apicids 512-631
    physical id 5: apicids 640-759
    physical id 6: apicids 768-887
    physical id 7: apicids 896-1015
  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):              960
      On-line CPU(s) list: 0-959
      Thread(s) per core:  2
      Core(s) per socket:  60
      Socket(s):           8
      NUMA node(s):        8
      Vendor ID:           GenuineIntel
      BIOS Vendor ID:      Intel(R) Corporation
      CPU family:          6
      Model:               143
      Model name:          Intel(R) Xeon(R) Platinum 8490H
      BIOS Model name:     Intel(R) Xeon(R) Platinum 8490H
      Stepping:            8
      CPU MHz:             3500.000
      CPU max MHz:         3500.0000
      CPU min MHz:         800.0000
      BogoMIPS:            3800.01
      L1d cache:           48K
      L1i cache:           32K
      L2 cache:            2048K
      L3 cache:            115200K
      NUMA node0 CPU(s):   0-59,480-539
      NUMA node1 CPU(s):   60-119,540-599
      NUMA node2 CPU(s):   120-179,600-659
      NUMA node3 CPU(s):   180-239,660-719
      NUMA node4 CPU(s):   240-299,720-779
      NUMA node5 CPU(s):   300-359,780-839
      NUMA node6 CPU(s):   360-419,840-899
      NUMA node7 CPU(s):   420-479,900-959
```

**(Continued on next page)**

Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =     3720

SPECrate®2017_int_peak = Not Run

| | |
|---|---|
| **CPU2017 License:** 3 | **Test Date:** Jan-2024 |
| **Test Sponsor:** HPE | **Hardware Availability:** Dec-2023 |
| **Tested by:** HPE | **Software Availability:** Dec-2023 |

## Platform Notes (Continued)

```
  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
                          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 cat_l2 cdp_l3 invpcid_single intel_ppin
                          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 hwp hwp_act_window hwp_pkg_req 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 amx_bf16 avx512_fp16 amx_tile amx_int8
                          flush_l1d arch_capabilities

  ----------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-59,480-539
    node 0 size: 507182 MB
    node 0 free: 506016 MB
    node 1 cpus: 60-119,540-599
    node 1 size: 508020 MB
    node 1 free: 507029 MB
    node 2 cpus: 120-179,600-659
    node 2 size: 508063 MB
    node 2 free: 506538 MB
    node 3 cpus: 180-239,660-719
    node 3 size: 508063 MB
    node 3 free: 507049 MB
    node 4 cpus: 240-299,720-779
    node 4 size: 508063 MB
    node 4 free: 507409 MB
    node 5 cpus: 300-359,780-839
    node 5 size: 508063 MB
    node 5 free: 507404 MB
    node 6 cpus: 360-419,840-899
    node 6 size: 508063 MB
    node 6 free: 507405 MB
    node 7 cpus: 420-479,900-959
    node 7 size: 506998 MB
    node 7 free: 506321 MB
    node distances:
    node   0    1    2    3    4    5    6    7
      0:  10   16   16   18   40   40   40   40
      1:  16   10   18   16   40   40   40   40
      2:  16   18   10   16   40   40   40   40
      3:  18   16   16   10   40   40   40   40
      4:  40   40   40   40   10   16   16   18
      5:  40   40   40   40   16   10   18   16
      6:  40   40   40   40   16   18   10   16
      7:  40   40   40   40   18   16   16   10

  ----------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       4160021440 kB

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

**(Continued on next page)**

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =    3720

SPECrate®2017_int_peak = Not Run

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

**Test Date:**              Jan-2024
**Hardware Availability:** Dec-2023
**Software Availability:**  Dec-2023

## Platform Notes (Continued)

```
 10. who -r
   run-level 3 Jan 18 23:34


   ----------------------------------------------------------
 11. Systemd service manager version: systemd 239 (239-74.el8_8)
   Default Target  Status
   multi-user      running


   ----------------------------------------------------------
 12. Services, from systemctl list-unit-files
   STATE     UNIT FILES
   enabled   ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
             abrt-journal-core abrt-oops abrt-vmcore abrt-xorg abrtd accounts-daemon atd auditd autovt@
             avahi-daemon chronyd cpuset_cpunodemap cpuset_memory_spread crond dcd dcdchkgracefulshutdown
             dcdshutdown display-manager gdm getty@ hpe-auto-config hpe_irqbalance import-state
             insights-client-boot iscsi iscsi-onboot kdump ksm ksmtuned libstoragemgmt libvirtd lm_sensors
             loadmodules lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
             nvmefc-boot-connections ostree-remount pmcd pmie pmlogger qemu-guest-agent rpcbind rsyslog
             rtkit-daemon selinux-autorelabel-mark smartd sshd sssd syslog sysstat timedatex tuned udisks2 vdo
             vgauthd vmtoolsd vsftpd
   disabled  abrt-ccpp abrt-pstoreoops arp-ethers autofs blk-availability bluetooth brltty
             canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot cgdcbxd
             chrony-wait cni-dhcp console-getty cpupower cups cups-browsed debug-shell dnf-system-upgrade
             dnsmasq dovecot ebtables fancontrol fcoe firewalld grafana-server gssproxy httpd httpd@ ibacm
             iprdump iprinit iprupdate ipsec irqbalance iscsid iscsiuio kpatch kvm_stat ledmon libvirt-guests
             lldpad man-db-restart-cache-update named named-chroot ndctl-monitor netcf-transaction nfs-blkmap
             nfs-convert nfs-server nftables nmb numad nvmf-autoconnect oddjobd pmfind pmie_farm pmlogger_farm
             pmproxy podman podman-auto-update podman-clean-transient podman-kube@ podman-restart postfix
             powertop psacct ras-mc-ctl rasdaemon rdisc rhcd rrdcached saslauthd sendmail sm-client smb snmpd
             snmptrapd spamassassin speech-dispatcherd srp_daemon srp_daemon_port@ sshd-keygen@
             switcheroo-control systemd-nspawn@ systemd-pstore systemd-resolved target targetclid tcsd
             tog-pegasus trace-cmd upower virtinterfaced virtnetworkd virtnodedevd virtnwfilterd virtproxyd
             virtqemud virtsecretd virtstoraged wpa_supplicant ypbind
   indirect  pcscd serial-getty@ spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh
             sssd-sudo virtlockd virtlogd vsftpd@
   masked    systemd-timedated

   ----------------------------------------------------------
 13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd2,gpt4)/boot/vmlinuz-4.18.0-477.10.1.el8_8.x86_64
   root=UUID=e65a817a-ecea-4172-8f09-b6a7120f7868
   ro
   loglevel=3
   rd.auto=1
   console=ttyS0,115200n8
   selinux=0
   security=
   console=ttyS0,115200
   udev.children-max=512
   nmi_watchdog=0
   uv_nmi.action=kdump
   add_efi_memmap
   tsc=nowatchdog
   bau=0
   earlyprintk=ttyS0,115200
   log_buf_len=8M
   numa_balancing=disable
   crashkernel=1G,high

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

**(Continued on next page)**

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =      3720

SPECrate®2017_int_peak = Not Run

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

**Test Date:**                  Jan-2024
**Hardware Availability:** Dec-2023
**Software Availability:** Dec-2023

## Platform Notes (Continued)

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


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


    ----------------------------------------------------------
  16. sysctl
    kernel.numa_balancing             0
    kernel.randomize_va_space         2
    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

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


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


    ----------------------------------------------------------
  19. OS release
    From /etc/*-release /etc/*-version
    os-release              Red Hat Enterprise Linux 8.8 (Ootpa)
    hpe-foundation-release  HPE Foundation Software 2.5.0, Build 750.0880.240110T0100.a.rhel88hpe-240110T0100
    redhat-release          Red Hat Enterprise Linux release 8.8 (Ootpa)
    system-release          Red Hat Enterprise Linux release 8.8 (Ootpa)


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

**(Continued on next page)**

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =    3720

SPECrate®2017_int_peak = Not Run

| **CPU2017 License:** 3 | **Test Date:** | Jan-2024 |
|---|---|---|
| **Test Sponsor:**    HPE | **Hardware Availability:** | Dec-2023 |
| **Tested by:**    HPE | **Software Availability:** | Dec-2023 |

## Platform Notes (Continued)

```
 20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
   itlb_multihit         Not affected
   l1tf                  Not affected
   mds                   Not affected
   meltdown              Not affected
   mmio_stale_data       Not affected
   retbleed              Not affected
   spec_store_bypass     Mitigation: Speculative Store Bypass disabled via prctl
   spectre_v1            Mitigation: usercopy/swapgs barriers and __user pointer sanitization
   spectre_v2            Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling, PBRSB-eIBRS: SW sequence
   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


 ----------------------------------------------------------
 21. Disk information
 SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p4 xfs   2.3T   19G  2.3T   1% /


 ----------------------------------------------------------
 22. /sys/devices/virtual/dmi/id
     Vendor:         HPE
     Product:        Compute Scale-up Server 3200
     Product Family: 1590PID03030201
     Serial:         5UF2491412-000


 ----------------------------------------------------------
 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:
     64x Samsung M321R8GA0BB0-CQKZH 64 GB 2 rank 4800



 ----------------------------------------------------------
 24. BIOS
 (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:      HPE
     BIOS Version:     Bundle:1.10.342-20231206_161054 SFW:009.010.108.000.2312042027
     BIOS Date:        12/04/2023
```

## Compiler Version Notes

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


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

**(Continued on next page)**

# SPEC CPU®2017 Integer Rate Result

## Hewlett Packard Enterprise
(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =       3720

SPECrate®2017_int_peak = Not Run

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

**Test Date:** Jan-2024
**Hardware Availability:** Dec-2023
**Software Availability:** Dec-2023

## Compiler Version Notes (Continued)

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

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

## Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

## Base Portability Flags

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

## Base Optimization Flags

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

C++ benchmarks:
`-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`

**(Continued on next page)**

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

Hewlett Packard Enterprise

(Test Sponsor: HPE)

HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =     3720

SPECrate®2017_int_peak = Not Run

| | | | |
|---|---|---|---|
| **CPU2017 License:** | 3 | **Test Date:** | Jan-2024 |
| **Test Sponsor:** | HPE | **Hardware Availability:** | Dec-2023 |
| **Tested by:** | HPE | **Software Availability:** | Dec-2023 |

# Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:

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

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

http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.html
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SDSS-rev1.0.html

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

http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SDSS-rev1.0.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 2024-01-19 00:36:10-0500.
Report generated on 2024-02-14 12:27:31 by CPU2017 PDF formatter v6716.
Originally published on 2024-02-14.