SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)
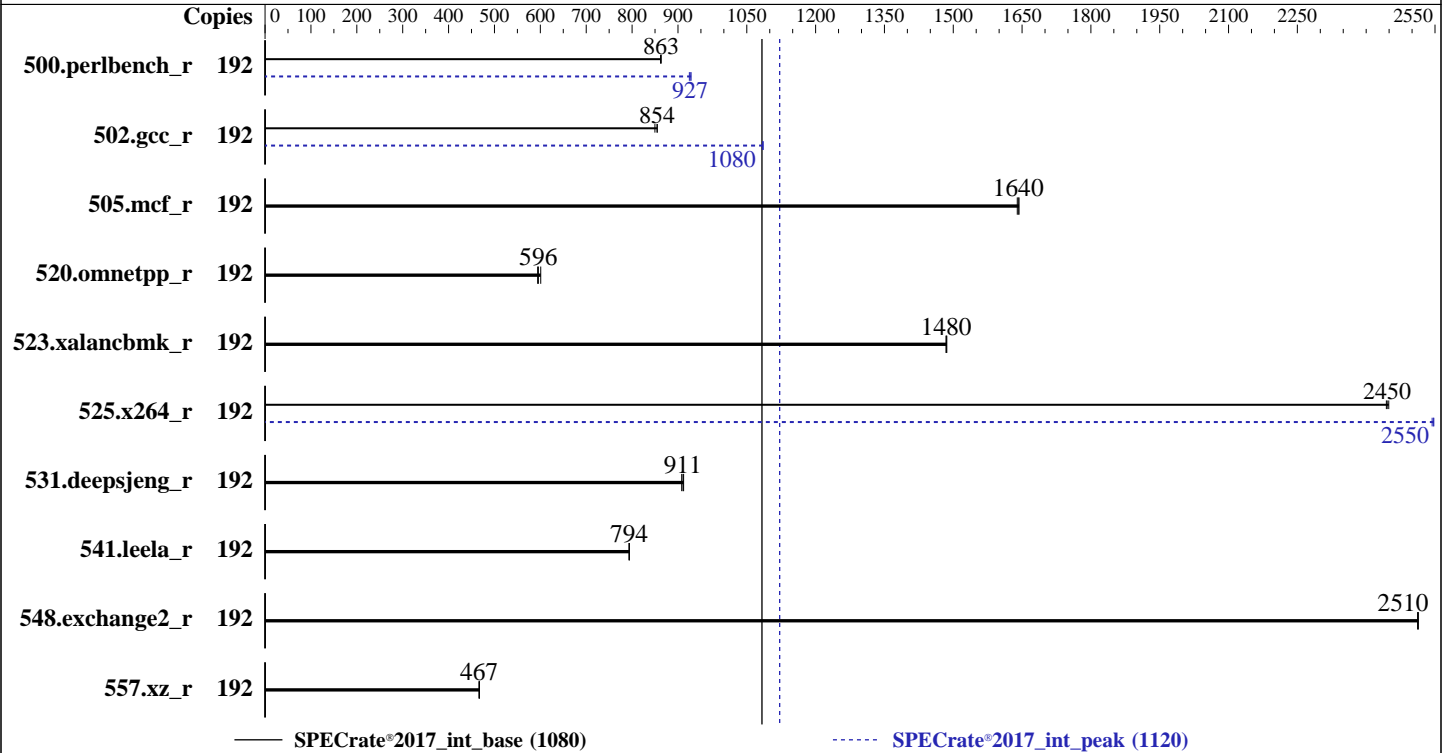
ProLiant Compute DL360 Gen12
(2.70 GHz, Intel Xeon 6747P)

$SPECrate®2017\_int\_base = 1080$

$SPECrate®2017\_int\_peak = 1120$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Mar-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024

Benchmark	Copies	Base	Peak
500.perlbench_r	192	863	927
502.gcc_r	192	854	1080
505.mcf_r	192	1640	
520.omnetpp_r	192	596	
523.xalancbmk_r	192	1480	
525.x264_r	192	2450	2550
531.deepsjeng_r	192	911	
541.leela_r	192	794	
548.exchange2_r	192	2510	
557.xz_r	192	467	

SPECrate®2017_int_base (1080)   SPECrate®2017_int_peak (1120)

Hardware

CPU Name: Intel Xeon 6747P

 Max MHz: 3900

 Nominal: 2700

Enabled: 96 cores, 2 chips, 2 threads/core

Orderable: 1,2 Chips

Cache L1: 64 KB I + 48 KB D on chip per core

 L2: 2 MB I+D on chip per core

 L3: 288 MB I+D on chip per chip

 Other: None

Memory: 512 GB (16 x 32 GB 2Rx8 PC5-6400B-R)

Storage: 1 x 3.2 TB NVMe SSD

Other: CPU Cooling: CLC

Software

OS: SUSE Linux Enterprise Server 15 SP6

Kernel 6.4.0-150600.21-default

Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;

Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;

Parallel: No

Firmware: HPE BIOS Version v1.20 02/14/2025 released Feb-2025

File System: xfs

System State: Run level 5 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 32/64-bit

Other: jemalloc memory allocator V5.0.1

Power Management: BIOS set to prefer performance at the cost of additional power usage

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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	192	**354**	**863**	354	863	355	862	192	329	929	**330**	**927**	331	925
502.gcc_r	192	320	850	**318**	**854**	318	855	192	**251**	**1080**	250	1090	251	1080
505.mcf_r	192	189	1640	**189**	**1640**	189	1640	192	189	1640	**189**	**1640**	189	1640
520.omnetpp_r	192	419	601	424	594	**423**	**596**	192	419	601	424	594	**423**	**596**
523.xalancbmk_r	192	**137**	**1480**	137	1480	136	1490	192	**137**	**1480**	137	1480	136	1490
525.x264_r	192	137	2450	**137**	**2450**	138	2440	192	132	2550	132	2540	**132**	**2550**
531.deepsjeng_r	192	241	912	**242**	**911**	242	908	192	241	912	**242**	**911**	242	908
541.leela_r	192	400	794	**401**	**794**	401	794	192	400	794	**401**	**794**	401	794
548.exchange2_r	192	200	2510	200	2510	**200**	**2510**	192	200	2510	200	2510	**200**	**2510**
557.xz_r	192	445	466	**444**	**467**	444	467	192	445	466	**444**	**467**	444	467
SPECrate®2017_int_base =	**1080**													
SPECrate®2017_int_peak =	**1120**													

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"
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>
tuned-adm profile was stopped using "systemctl stop tuned"
```

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.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
```

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General Notes (Continued)

```
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

```
BIOS Configuration:
Workload Profile set to General Throughput Compute
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Last Level Cache (LLC) Prefetch set to Enabled
XPT Prefetch set to Disabled
Intel UPI Prefetch set to Disabled
Workload Profile set to Custom
 DCU Stream Prefetcher set to Disabled
 Adjacent Sector Prefetch set to Disabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Wed Mar 26 02:39:56 2025

 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 254 (254.10+suse.84.ge8d77af424)
 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. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
 ------------------------------------------------------------

 ------------------------------------------------------------
 1. uname -a
   Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
   x86_64 x86_64 x86_64 GNU/Linux

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

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Platform Notes (Continued)

```
 2. w
   02:39:56 up 1 min,  3 users,  load average: 0.18, 0.10, 0.04
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0    172.17.1.96      02:39   12.00s  0.88s  0.01s -bash

   ------------------------------------------------------------
 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) 2062644
   max locked memory       (kbytes, -l) 8192
   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) 2062644
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited

   ------------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize=42
  sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
  sshd: root [priv]
  sshd: root@pts/0
  -bash
  -bash
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=192 -c
    ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=96 --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=192 --configfile
    ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=96 --define physicalfirst
    --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
    --runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
  $SPEC = /home/cpu2017

   ------------------------------------------------------------
 6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) 6747P
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 173
   stepping        : 1
   microcode       : 0x1000380
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
   cpu cores       : 48
   siblings        : 96
   2 physical ids (chips)
   192 processors (hardware threads)
```

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Platform Notes (Continued)

```
     physical id 0: core ids 0-23,64-87
     physical id 1: core ids 0-23,64-87
     physical id 0: apicids 0-47,128-175
     physical id 1: apicids 256-303,384-431
  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 2.39.3:
    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):                             192
    On-line CPU(s) list:                0-191
    Vendor ID:                          GenuineIntel
    BIOS Vendor ID:                     Intel(R) Corporation
    Model name:                         Intel(R) Xeon(R) 6747P
    BIOS Model name:                    Intel(R) Xeon(R) 6747P  CPU @ 2.7GHz
    BIOS CPU family:                    179
    CPU family:                         6
    Model:                              173
    Thread(s) per core:                 2
    Core(s) per socket:                 48
    Socket(s):                          2
    Stepping:                           1
    BogoMIPS:                           5400.00
    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 intel_ppin cdp_l2
                                        ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept
                                        vpid ept_ad 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 user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida
                                        arat pln pts hfi vnmi 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 ibt amx_bf16 avx512_fp16
                                        amx_tile amx_int8 flush_l1d arch_capabilities
    Virtualization:                     VT-x
    L1d cache:                          4.5 MiB (96 instances)
    L1i cache:                          6 MiB (96 instances)
    L2 cache:                           192 MiB (96 instances)
    L3 cache:                           576 MiB (2 instances)
    NUMA node(s):                       4
    NUMA node0 CPU(s):                  0-23,96-119
    NUMA node1 CPU(s):                  24-47,120-143
    NUMA node2 CPU(s):                  48-71,144-167
    NUMA node3 CPU(s):                  72-95,168-191
    Vulnerability Gather data sampling: Not affected
    Vulnerability Itlb multihit:        Not affected
```

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Platform Notes (Continued)

```
  Vulnerability L1tf:                   Not affected
  Vulnerability Mds:                    Not affected
  Vulnerability Meltdown:               Not affected
  Vulnerability Mmio stale data:        Not affected
  Vulnerability Reg file data sampling: Not affected
  Vulnerability Retbleed:               Not affected
  Vulnerability Spec rstack overflow:   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 / Automatic IBRS; IBPB conditional; RSB filling;
                                        PBRSB-eIBRS Not affected; BHI BHI_DIS_S
  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     4.5M   12 Data           1      64       1             64
      L1i       64K       6M   16 Instruction    1      64       1             64
      L2         2M     192M   16 Unified        2    2048       1             64
      L3       288M     576M   16 Unified        3  294912       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: 0-23,96-119
  node 0 size: 128699 MB
  node 0 free: 127373 MB
  node 1 cpus: 24-47,120-143
  node 1 size: 129011 MB
  node 1 free: 128304 MB
  node 2 cpus: 48-71,144-167
  node 2 size: 129011 MB
  node 2 free: 128099 MB
  node 3 cpus: 72-95,168-191
  node 3 size: 128969 MB
  node 3 free: 127537 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:      528068592 kB

  ------------------------------------------------------------
10. who -r
   run-level 5 Mar 26 02:38

  ------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
   Default Target  Status
   graphical       running

  ------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE            UNIT FILES
```

(Continued on next page)

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Platform Notes (Continued)

```
  enabled           ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
                    bluetooth cron display-manager getty@ irqbalance issue-generator kbdsettings klog
                    lvm2-monitor nscd nvmefc-boot-connections nvmf-autoconnect postfix purge-kernels rollback
                    rsyslog smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
                    wickedd-nanny wpa_supplicant
  enabled-runtime   systemd-remount-fs
  disabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofs
                    autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
                    chrony-wait chronyd console-getty cups cups-browsed debug-shell dnsmasq ebtables
                    exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd
                    issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb openvpn@
                    ostree-remount rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@
                    smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
                    systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync
                    systemd-timesyncd tuned udisks2 update-system-flatpaks upower vncserver@ wpa_supplicant@
  indirect          pcscd saned@ systemd-userdbd wickedd

  ----------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
  root=UUID=ad77ff4c-3b83-44e0-a924-423ebd972f45
  splash=silent
  resume=/dev/disk/by-uuid/f1b43a48-2334-43e8-bfc6-98384ea036ac
  mitigations=auto
  quiet
  security=apparmor

  ----------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 103:
    Unable to determine current policy
    boost state support:
      Supported: yes
      Active: yes

  ----------------------------------------------------------------
15. tuned-adm active
  It seems that tuned daemon is not running, preset profile is not activated.
  Preset profile: balanced

  ----------------------------------------------------------------
16. 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                   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
```

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Platform Notes (Continued)

```
   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_shared           256
   max_ptes_swap              64
   pages_to_scan            4096
   scan_sleep_millisecs    10000


   ----------------------------------------------------------------
19. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP6


   ----------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p3 xfs   2.0T  500G  1.5T  26% /home


   ----------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
   Vendor:         HPE
   Product:        HPE ProLiant Compute DL360 Gen12
   Product Family: ProLiant
   Serial:         D249RP0108


   ----------------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.4 follows.  WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
   "DMTF SMBIOS" standard.
   Memory:
     8x Hynix HMCG88AHBRA471N 32 GB 2 rank 6400
     8x Hynix HMCG88AHBRA472N 32 GB 2 rank 6400


   ----------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        HPE
   BIOS Version:       1.20
   BIOS Date:          02/14/2025
   BIOS Revision:      1.20
   Firmware Revision: 1.10
```

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Compiler Version Notes

```
==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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 2024.1.0 Build 20240308
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------------------------------------------------------------------------------


==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
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==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_r(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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------------------------------------------------------------------------------


==============================================================================
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 2024.1.0 Build 20240308
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------------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------
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------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

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 Compute DL360 Gen12
(2.70 GHz, Intel Xeon 6747P)

$SPECrate^{®}2017\_int\_base = 1080$

$SPECrate^{®}2017\_int\_peak = 1120$

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

Test Date: Mar-2025
Hardware Availability: Mar-2025
Software Availability: Jun-2024

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/opt/intel/oneapi/compiler/2024.1/lib -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/opt/intel/oneapi/compiler/2024.1/lib -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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

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SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
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ProLiant Compute DL360 Gen12
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SPECrate®2017_int_base = 1080

SPECrate®2017_int_peak = 1120

CPU2017 License: 3	**Test Date:** Mar-2025
Test Sponsor: HPE	**Hardware Availability:** Mar-2025
Tested by: HPE	**Software Availability:** Jun-2024

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`

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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc`

502.gcc_r: `-m32 -L/opt/intel/oneapi/compiler/2024.1/lib32 -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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc`

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

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SPECrate®2017_int_base = 1080

SPECrate®2017_int_peak = 1120

CPU2017 License: 3		**Test Date:**	Mar-2025
Test Sponsor:	HPE	**Hardware Availability:**	Mar-2025
Tested by:	HPE	**Software Availability:**	Jun-2024

Peak Optimization Flags (Continued)

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

Fortran benchmarks:

548.exchange2_r: `basepeak = yes`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-GNR-rev1.1.html
http://www.spec.org/cpu2017/flags/Intel-ic2024-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-GNR-rev1.1.xml
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml

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

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