**SPEC CPU®2017 Integer Rate Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen11  
(2.90 GHz, Intel Xeon Gold 5415+)

**SPECrate®2017_int_base = 177**  
**SPECrate®2017_int_peak = 182**

<table>
<thead>
<tr>
<th>Task</th>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>135</td>
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<td>502.gcc_r</td>
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<td>505.mcf_r</td>
<td>32</td>
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<tr>
<td>520.omnetpp_r</td>
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<td>548.exchange2_r</td>
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<tr>
<td>557.xz_r</td>
<td>32</td>
<td>77.1</td>
<td></td>
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</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 5415+  
- **Max MHz:** 4100  
- **Nominal:** 2900  
- **Enabled:** 16 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:** 22.5 MB I+D on chip per chip
- **Memory:** 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R, running at 4400)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 15 SP4  
- **Kernel:** 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:** No  
- **Firmware:** HPE BIOS Version v1.30 03/01/2023 released Mar-2023  
- **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 and OS set to prefer performance at the cost of additional power usage
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Results Table

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<td>76.9</td>
<td>32</td>
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</tr>
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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"
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<tr>
<td>Hardware Availability</td>
<td>Mar-2023</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

### 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 Redhat 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) is mitigated in the system as tested and documented.

### Platform Notes

- The system ROM used for this result contains Intel microcode version 0x2b000161 for the Intel Xeon Gold 5415+ 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
- The reported date by sysinfo is incorrect due to computer clock being not set correctly. The correct test date is: Apr-2023.
- `sysinfo` program `/home/cpu2017/bin/sysinfo`
- Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197 running on localhost Thu Jul 28 21:54:24 2022
- 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)

(Continued on next page)
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**Platform Notes (Continued)**

12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
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`
   
   21:54:24 up 15 min, 0 users, load average: 0.00, 0.04, 0.09
   USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
-----------------------------------------------------------------------------------------------
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 (-l) 2062886
   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) 2062886
   virtual memory (kbytes, -v) unlimited
   file locks (-x) unlimited

-----------------------------------------------------------------------------------------------
5. `sysinfo process ancestry`
   
   /usr/lib/systemd/systemd --switched-root --system --deserialize 30
   sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   sshd: root@notty
   bash: cd $SPEC/ && $SPEC/intrate.sh
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=32 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=16 --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=32 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=16 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
   --runmode rate --tune base:peak --size reftate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2

(Continued on next page)
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--- SPEC CPU®2017 Integer Rate Result ---

**Platform Notes (Continued)**

```bash
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) Gold 5415+
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 8
   microcode       : 0x2b0001b0
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swaps
   cpu cores       : 8
   siblings        : 16
   2 physical ids (chips)
   32 processors (hardware threads)
   physical id 0: core ids 0-7
   physical id 1: core ids 0-7
   physical id 0: apicids 0-15
   physical id 1: apicids 128-143
   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):                          32
On-line CPU(s) list:             0-31
Vendor ID:                       GenuineIntel
Model name:                      Intel(R) Xeon(R) Gold 5415+
CPU family:                      6
Model:                           143
Thread(s) per core:              2
Core(s) per socket:              8
Socket(s):                       2
Stepping:                        8
BogoMIPS:                        5800.00

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 rdtsc
   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 ssse4_1
   sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave f16c rdrand
   lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 cat_12 cdp_13
   invpcid_single cdp_12 ssbd mbid ibrs ibpb stibp ibrs Enhanced tpr_shadow
   vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bni hle avx2 smep
   bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
   avx512ifm avx512sf clflushopt clwb intel_pt avx512ldc sha ni avx512bw avx512v
   xsaveopt xsaves xgetbv1 xsaveas cqm_llc cqm_occup_llc cqm_mbb_total
   cqm_mbb_local split_lock_detect avx_vnni avx512_bf16 vbnoinvd dtherm ida
   arat pln pts avx512vbm umip pku ospke waitpkg avx512_vbm2 gfnl vaes
   vpclmulqdq avx512_vnni avx512_bitalgc tme avx512_vpopcntdq la57 rdpid
   bus_lock_detect cldemote movdiri movdir64b enqcmd md_clear serialize
   tsxtdtrk pconfig arch_lbr avx512_fp16 amx_tile flush_lld arch_capabilities

Virtualization:                  VT-x
```

(Continued on next page)
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Test Date: Apr-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Platform Notes (Continued)

L1d cache: 768 KiB (16 instances)
L1i cache: 512 KiB (16 instances)
L2 cache: 32 MiB (16 instances)
L3 cache: 45 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
Vulnerability Itlb multihit: Not affected
Vulnerability L1tfs: 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 768K 12 Data 1 64 1 64
L1i 32K 512K 8 Instruction 1 64 1 64
L2 2M 32M 16 Unified 2 2048 1 64
L3 22.5M 45M 15 Unified 3 24576 1 64

8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0-7,16-23
node 0 size: 257756 MB
node 0 free: 255995 MB
node 1 cpus: 8-15,24-31
node 1 size: 257989 MB
node 1 free: 257343 MB
node distances:
node   0   1
0:  10  20
1:  20  10

9. /proc/meminfo
MemTotal: 528124240 kB

10. who -r
run-level 5 Jul 28 21:39

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

12. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron
display-manager getty@ haveged irqbalance iscsi issue-generator kbdsettings klog
lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4
wicked-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant
enabled-runtime systemd-remount-fs

(Continued on next page)
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Platform Notes (Continued)

disabled
NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon
appstream-sync-cache autofs autoyast-initscripts blk-availability bluetooth-mesh
boot-sysctl ca-certificates chrony-wait chrony-clone console-getty cups cups-browsed
debug-shel dnsmasq ebtables exchange-bmc-os-info firewallld gpm grub2-once
haveged-switch-root ipmi ipmielvd iscsl-init iscsi-id iscslui issue-add-ssh-keys kexec-load
lunmask man-db-create multipathd nfs nfs-bkilmap nm-cloud-setup nmb openvpn ostree
ppoe pppoe-server rdisc rpcregconf rpmcheck rsysrd rtkit-daemon serial-getty8
smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
systemd-network-generator systemd-sysext systemd-time-syncd systemd-timers
upower wpa_supplicant0
indirect
pcscd saned@ wickedd

-------------------------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=16038a66-0f95-499e-a756-89b7efc430ae
   splash=silent
   resume=/dev/disk/by-uuid/1ac00a3a-7fbb-40b6-8213-f8e2dec6f1b0
   mitigations=auto
   quiet
   security=apparmor

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

-------------------------------------------------------------------------------
15. sysctl
   kernel.numa_balancing 1
   kernel.randomize_va_space 2
   vm.compaction_proactiveness 20
   vm.dirty_background_bytes 0
   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.extrgahex_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+madvice [madvice] never
   enabled [always] madvice never
   hpage_pmd_size 2097152
   shmem_enabled always within_size advise [never] deny force

(Continued on next page)
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Platform Notes (Continued)
17. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs  60000
   defrag                 1
   max_ptes_none          511
   max_ptes_shared        256
   max_ptes_swap          64
   pages_to_scan          4096
   scan_sleep_millisecs   10000

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

------------------------------------------------------------
19. Disk information
   SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used  Avail Use% Mounted on
   /dev/sda4      xfs   349G   90G  260G  26% /home

------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
   Vendor:         HPE
   Product:        ProLiant DL360 Gen11
   Product Family: ProLiant
   Serial:         CNX20800PZ

------------------------------------------------------------
21. dmidecode
   Additional information from dmidecode 3.2 follows. WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
   Memory:
   1x Hynix HMG88AEBRA16BN 32 GB 2 rank 4800, configured at 4400
   7x Hynix HMG88MEBRA113N 32 GB 2 rank 4800, configured at 4400
   8x Hynix HMG88MEBRA115N 32 GB 2 rank 4800, configured at 4400

------------------------------------------------------------
22. BIOS
   (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       HPE
   BIOS Version:      1.30
   BIOS Date:         03/01/2023
   BIOS Revision:     1.30
   Firmware Revision: 1.20

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)

(Continued on next page)
Compiler Version Notes (Continued)

<table>
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<th>557.xz_r(base, peak)</th>
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<tbody>
<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201</td>
</tr>
<tr>
<td>Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

| 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 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

| 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

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen11
(2.90 GHz, Intel Xeon Gold 5415+)

SPECrate®2017_int_base = 177
SPECrate®2017_int_peak = 182

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

Base Portability Flags (Continued)

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
-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
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL360 Gen11  
(2.90 GHz, Intel Xeon Gold 5415+)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 177
SPECrate®2017_int_peak = 182

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

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

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/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:

(Continued on next page)
## SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen11  
(2.90 GHz, Intel Xeon Gold 5415+)

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

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<tr>
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</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Dec-2022</td>
</tr>
</tbody>
</table>

### Peak Optimization Flags (Continued)

- 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

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/Intel-ic2023-official-linux64.html)
- [http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.html](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.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/Intel-ic2023-official-linux64.xml)
- [http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.xml](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.xml)

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