# SPEC CPU®2017 Floating Point Rate Result

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant ML350 Gen11

(2.00 GHz, Intel Xeon Gold 5420+)

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**SPECrate®2017_fp_base** = 588  
**SPECrate®2017_fp_peak** = 588

---

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

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</tbody>
</table>

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### Hardware

- **CPU Name:** Intel Xeon Gold 5420+  
- **Max MHz:** 4100  
- **Nominal:** 2000  
- **Enabled:** 56 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:** 52.5 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx4 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.e9_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;  
- **Firmware:** HPE BIOS Version v1.30 03/01/2023 released Mar-2023  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
## Results Table

<table>
<thead>
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</tr>
</tbody>
</table>

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:
Filesyste page cache synced and cleared with:
sync; echo 3 > /proc/sys/vm/drop_caches
runcpu command invoked through numacli i.e.:
n numacl --interleave=all runcpu <etc>
IRQ balance service was stopped using "systemctl stop irqbalance.service"
tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"
perf-bias for all the CPUs is set using "cpupower set -b 0"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/jd5.0.1-64"
MALLOC_CONF = "retain:true"
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML350 Gen11
(2.00 GHz, Intel Xeon Gold 5420+)

SPECrate®2017_fp_base = 588
SPECrate®2017_fp_peak = 588

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)
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

Platform Notes

The system ROM used for this result contains Intel microcode version 0x2b0001b0 for
the Intel Xeon Gold 5420+ processor.
BIOS Configuration:
Workload Profile set to General Throughput Compute
Thermal Configuration set to Maximum Cooling
Enhanced Processor Performance Profile set to Aggressive
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Memory Patrol Scrubbing set to Disabled
Workload Profile set to Custom
DCU Stream Prefetcher set to Disabled
Adjacent Sector Prefetch set to Disabled
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 Wed Apr 12 16:10:24 2023

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

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4. ulimit -a
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7. lscpu
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9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 250 (250-6.e19_0)
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/klugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS

(Continued on next page)
Platform Notes (Continued)

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 GNU/Linux
   ```

2. `w`
   ```
   16:10:24 up 15 min, 0 users, load average: 0.00, 0.00, 0.00
   USER    TTY LOGNAME   IDLE  JCPU  PCPU WHAT
   -------------
   root     pts/0      root    0.00 0.00 0.00  
   ```

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) 2062792
   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) 2062792
   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 -c cd $SPEC/ && $SPEC/SPR_fprate.sh
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 --c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=56 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=56 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
   --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.fprate.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 5420+
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 7
   ```

(Continued on next page)
Platform Notes (Continued)

microcode       : 0x2b0001b0
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores       : 28
siblings        : 56
2 physical ids (chips)
112 processors (hardware threads)
physical id 0: core ids 0-27
physical id 1: core ids 0-27
physical id 0: apicids 0-55
physical id 1: apicids 128-183
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):                          112
On-line CPU(s) list:             0-111
Vendor ID:                       GenuineIntel
BIOS Vendor ID:                  Intel(R) Corporation
Model name:                      Intel(R) Xeon(R) Gold 5420+
BIOS Model name:                 Intel(R) Xeon(R) Gold 5420+
CPU family:                      6
Model:                           143
Thread(s) per core:              2
Core(s) per socket:              28
Socket(s):                       2
Stepping:                        7
BogoMIPS:                        4000.00
Flags:                           fpu vme de pae tsc mar pse mce cx8 apic sep mtrr pge mca cmov pat pse36
clflush dts acpi mxr fxsr asid 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
des_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_12 ssbd mba ibrs ibpb ibs Enhanced tpr_shadow
vmx flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmon avx2 smep bmi2
erms invpcid cqm rdt_a avx512f avx512dq rdseed adx amap avx512sfma
clflushopt clwb intel_pt avx512cd sha_mmi avx512bw avx512vl xsavesep xtace
xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
split_lock_detect avx_vnni avx512_bc16 wbnoindv dtherm ida arat pin pts
avx512vbmi umpk pku ospe cache waitpkg avx512vbmi2 gfi enve vaes vpcmldq
avx512_vnni avx512_bitalg tme avx512_vpopcntdq ls57 rdpid bus_lock_detect
clcmdet movdiri movdir64b enqcmd fast_mdl_clear serialize tsxtdtrk pconf
arch_bvr avx512_fp16 amx_tile flush_lld arch_capabilities
Virtualization:                  VT-x
L1d cache:                       2.6 MiB (56 instances)
L1i cache:                       1.8 MiB (56 instances)
L2 cache:                        112 MiB (56 instances)
L3 cache:                        105 MiB (2 instances)
NUMA node(s):                    2
NUMA node0 CPU(s):              0-27,56-83
NUMA node1 CPU(s):              28-55,84-111
Vulnerability Itlb multihit:    Not affected

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

**Test Sponsor:** Hewlett Packard Enterprise  
**CPU:** ProLiant ML350 Gen11  
**Model:** (2.00 GHz, Intel Xeon Gold 5420+)  
**License:** 3

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<td>Mar-2023</td>
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<tr>
<td>Software Availability</td>
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</table>

#### SPECrate®2017 fp_base = 588

#### SPECrate®2017 fp_peak = 588

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### Platform Notes (Continued)

- **Vulnerability L1tf:** Not affected
- **Vulnerability Mds:** Mitigation; 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 Tsa async abort:** Not affected

---

### From lscpu --cache:

**NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE**

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<tr>
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<td>L3</td>
<td>52.5M</td>
<td>105M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
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</tbody>
</table>

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### 8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

| available | 2 nodes (0-1) |
| node 0 cpus: | 0-27,56-83 |
| node 0 size: | 257712 MB |
| node 0 free: | 256570 MB |
| node 1 cpus: | 28-55,84-111 |
| node 1 size: | 258025 MB |
| node 1 free: | 257283 MB |

---

### 9. /proc/meminfo

```
MemTotal: 528115676 kB
```

---

### 10. who -r

```
run-level 3 Apr 12 15:55
```

---

### 11. Systemd service manager version: systemctl list-unit-files

<table>
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<th>UNIT FILES</th>
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<tr>
<td>enabled</td>
<td>NetworkManager NetworkManager-dispatcher NetworkManager-wait-online audittd chronyd crond dbus-broker firewalld getty@ irqbalance iscsi iscsi-onboot kdump libstoragemgmt lvmonitor mmmonitor microcode multipathd nis-domainname rhsmcertd rpicbind rsyslog selinux-automount-label mark sshd ssd systat systemd-network-generator udisks2 upower virtmemud</td>
</tr>
<tr>
<td>disabled</td>
<td>blk-availabilitybritty canberra-system-bootup canberra-system-shutdown chrony-wait console-getty cpupower debug-shell dnsmsq qgproxy httpd httpd@ hwloc-dump-hdata ipa-custodia iscsi iscsi-onboot kvm_stat libvirt-guests libvirt-man-db-restart-cache-update ndctl-monitor nfs-bkmap nfs-server nftables smb numadm pmcd pmpfind pmlie pmlie_farm pmllogger_pmllogger_farm pmproxy radiusd rdisc rham rhsm-facts rpmdb-rebuild saslauthd serial-getty@ smbi speech-dispatcherd sshd-keysten@ systemd-boot-check-no-failures systemd-nspawn@ systemd-pstore systemd-sysext virtnetworkd</td>
</tr>
</tbody>
</table>
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML350 Gen11
(2.00 GHz, Intel Xeon Gold 5420+)

SPECrate®2017_fp_base = 588
SPECrate®2017_fp_peak = 588

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

Platform Notes (Continued)

virtproxyd virtsecretd virtstoraged winbind
indirect
cscd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-shh sssd-sudo virtlockd
virtlogd

13. 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

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.extrfrag_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+madvis[e] [madvis[e]] never
   enabled  [always] madvis[e] never
   hpage_pmd_size  2097152
   shmem_enabled  always within_size advise [never] deny force

17. /sys/kernel/mm/transparent_hugepage/khugepaged
alloc_sleep_millisecs  60000
   defrag  1
max_ptes_none  511
max_ptes_shared  256
max_ptes_swap  64
pages_to_scan  4096
scan_sleep_millisecs  10000

(Continued on next page)
Platform Notes (Continued)

18. 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)

19. Disk information
   SPEC is set to: /home/cpu2017
   
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   372G  159G  213G  43% /home

20. /sys/devices/virtual/dmi/id
   Vendor:         HPE
   Product:        ProLiant ML350 Gen11
   Product Family: ProLiant
   Serial:         CNX20800P4

21. 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:
   3x Hynix HMCG88AEBRA168N 32 GB 2 rank 4800, configured at 4400
   9x Hynix HMCG88MEBRA113N 32 GB 2 rank 4800, configured at 4400
   4x Hynix HMCG88MEBRA115N 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

<table>
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<tr>
<th>C</th>
<th>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_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 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
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<table>
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<tr>
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<th>508.namd_r(base, peak) 510.parest_r(base, peak)</th>
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</table>

<table>
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<tr>
<th>C++, C</th>
<th>511.povray_r(base, peak) 526.blender_r(base, peak)</th>
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</thead>
</table>

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

C++, C, Fortran | 507.cactuBSSN_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.
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 | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_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.

Fortran, C | 521.wrf_r(base, peak) 527.cam4_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
Benchmarks using both Fortran and C: ifx icx
Benchmarks using both C and C++: icpx icx
Benchmarks using Fortran, C, and C++: icpx icx ifx
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant ML350 Gen11
(2.00 GHz, Intel Xeon Gold 5420+)

| SPECrate®2017_fp_base = 588 |
| SPECrate®2017_fp_peak = 588 |

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

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-ffto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -ffto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -ffto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-ffto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -ffto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512

(Continued on next page)
Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):
- ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
- w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
- ffast-math -flto -mfpmath=sse -funroll-loops
- qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
- nostandard-realloc-lhs -align array32byte -auto -ljemalloc
- L/usr/local/jemalloc64-5.0.1/lib

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant ML350 Gen11  
(2.00 GHz, Intel Xeon Gold 5420+)

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

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<tr>
<td>Software Availability:</td>
<td>Mar-2023</td>
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## Peak Optimization Flags (Continued)

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: basepeak = yes

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: basepeak = yes

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_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-SPR-rev1.2.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-rev1.2.xml  
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml
## SPEC CPU®2017 Floating Point Rate Result

### Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant ML350 Gen11
(2.00 GHz, Intel Xeon Gold 5420+)

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

### Test Details

- **Test Date**: Apr-2023
- **Hardware Availability**: Mar-2023
- **Software Availability**: Mar-2023

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Tested with SPEC CPU®2017 v1.1.9 on 2023-04-12 06:40:24-0400.
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