SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL320 Gen11
(2.90 GHz, Intel Xeon Gold 5415+)

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SPECrater®2017_fp_base = 131
SPECrater®2017_fp_peak = 133

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

Test Date: Jun-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Hardware
CPU Name: Intel Xeon Gold 5415+
Max MHz: 4100
Nominal: 2900
Enabled: 8 cores, 1 chip, 2 threads/core
Orderable: 1 Chip
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
Other: None
Memory: 256 GB (8 x 32 GB 2Rx8 PC5-4800B-R, running at 4400)
Storage: 1 x 480 GB SATA SSD
Other: None

Software
OS: Red Hat Enterprise Linux 9.0 (Plow)
Kernel 5.14.0-70.13.1.el9_0.x86_64
Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++
Compiler for Linux;
Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: HPE BIOS Version v1.40 05/18/2023 released May-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 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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HPE

SPECrate®2017_fp_base = 131
SPECrate®2017_fp_peak = 133

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
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<tbody>
<tr>
<td>503.bwaves_r</td>
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<td>597</td>
<td>267</td>
<td>602</td>
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<td>600</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<td>120</td>
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<td>526.blender_r</td>
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<td>250</td>
<td>97.3</td>
<td>252</td>
<td>96.9</td>
<td>252</td>
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<td>549.fotonik3d_r</td>
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<td>488</td>
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<td>554.roms_r</td>
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<td>348</td>
<td>73.1</td>
<td>348</td>
<td>73.2</td>
<td>348</td>
<td>73.0</td>
</tr>
</tbody>
</table>

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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 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/je5.0.1-64"
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

(Continued on next page)
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General Notes (Continued)

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 0x2b0004a1 for the Intel Xeon Gold 5415+ 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 Sat Jun 17 15:16:44 2023

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

Table of contents

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpupinfo
7. ls cpup
8. numacl -- --hardware
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. 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

(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 x86_64 GNU/Linux

2. `w`
   
   15:16:44 up 3 min,  0 users, load average: 0.00, 0.00, 0.00
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   ------------------------------------------------------------

3. Username
   
   From environment variable $USER: root

4. `ulimit -a`
   
   real-time non-blocking time (microseconds, -R) unlimited
   core file size (blocks, -c) 0
   data seg size (kbytes, -d) unlimited
   scheduling priority (-e) 0
   file size (blocks, -f) unlimited
   pending signals (-i) 1029838
   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) 1029838
   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 [priv]
   sshd: root@notty
   bash -c cd $SPEC/fprate.sh
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
   ic2023.0-1in-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=8 --define physicalfirst
   --define no-numa --define drop_caches fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
   ic2023.0-1in-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=8 --define physicalfirst
   --define no-numa --define base,peak --output_format all --define drop_caches --nopower --runmode rate --tune
   base:peak --size referate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/CPU2017
   $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 : 0x2b0004a1

(Continued on next page)
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Platform Notes (Continued)

bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores       : 8
siblings        : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-7
physical id 0: apicids 0-15
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):                          16
On-line CPU(s) list:             0-15
Vendor ID:                       GenuineIntel
BIOS Vendor ID:                  Intel(R) Corporation
Model name:                      Intel(R) Xeon(R) Gold 5415+
BIOS 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):                       1
Stepping:                        8
BogoMIPS:                        5800.00
Flags:                           fpu vme de pse tsc msr pae mce cmov pat pse36
                                clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdscrp
                                lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                                nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
data憧 cpu vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca ssse3 sse4_1
                                x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                                lahf_lm abm 3nowprefetch cpuid_fault epb cat_13 cat_12 cdp_13
                                invpcid_single cdp_12 ssbd mba ibrs ibpb ibrs Enhanced tpr_shadow
                                vmx flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2
                                erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
                                clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaves xtune
                                xgetbv1 xsaves cqm_llc cqm_occup_11c cqm_mbm_total cqm_mbm_local
                                split_lock_detect avx_vnni avx512_bf16 wnnoinvd dtherm ida arat pin pts
                                avx512v bmi umip pkp osppke waitpkg avx512_vbmi2 gfini vaes vpclmulqdq
                                avx512_vnni avx512_bitalgo tma avx512_vpopcntdq la57 rdpid bus_lock_detect
cldemote movdiri movdir64b enqcmd fmmul md_clear serialize tsxidtrk pconfign
                                arch_addr avx512_fp16 amx_tile flush_lld arch_capabilities

Virtualization:      VT-x
L1d cache:            384 KiB (8 instances)
L1i cache:            256 KiB (8 instances)
L2 cache:             16 MiB (8 instances)
L3 cache:             22.5 MiB (1 instance)
NUMA node(s):         1
NUMA node0 CPU(s):    0-15
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:   Not affected
Vulnerability Mds:    Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl

(Continued on next page)
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<th>CPU2017 License: 3</th>
<th>Test Date:</th>
<th>Jun-2023</th>
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<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability:</td>
<td>May-2023</td>
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<tr>
<td>Tested by: HPE</td>
<td>Software Availability:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

**SPECrates**  
SPECrate®2017_fp_base = 131  
SPECrate®2017_fp_peak = 133

**Platform Notes (Continued)**

| 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`:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
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</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>384K</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>256K</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>16M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>22.5M</td>
<td>22.5M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>24576</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

---

8. `numactl --hardware`

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

available: 1 nodes (0)

node 0 cpus: 0-15
node 0 size: 257499 MB
node 0 free: 256686 MB
node distances:

node   0
    0: 10

---

9. `/proc/meminfo`

MemTotal: 263679376 kB

---

10. `who -r`

run-level 3 Jun 17 15:13

---

11. Systemd service manager version: systemd 250 (250-6.e19_0)

Default Target | Status
--- | ---
multi-user | running

---

12. Services, from systemctl list-unit-files

<table>
<thead>
<tr>
<th>STATE</th>
<th>UNIT FILES</th>
</tr>
</thead>
<tbody>
<tr>
<td>enabled</td>
<td>NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond dbus-broker firewallld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode nis-domainname rhsmcrtd rsyslog selinux-autorelabel-mark sshd sssd systemd-network-generator tuned udisks2</td>
</tr>
<tr>
<td>enabled-runtime</td>
<td>systemd-remount-fs</td>
</tr>
<tr>
<td>disabled</td>
<td>blk-availability chrony-wait console-getty cpupower debug-shell kvm_stat man-db-restart-cache-update nftables powertop rdisc rshm rqm-facts rpmdb-rebuild serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext indirect sssd-autofs sssd-kcm sssd-ns sssd-pan sssd-pam sssd-ssh sssd-sudo</td>
</tr>
</tbody>
</table>

---

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`

(Continued on next page)
Platform Notes (Continued)

analyzing CPU 0:
   Unable to determine current policy
   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 20
   vm dirty background bytes   0
   vm dirty background ratio   10
   vm dirty bytes              0
   vm dirty expire centisecs   3000
   vm dirty ratio              40
   vm dirty writeback centisecs 500
   vm dirtytime expire seconds 43200
   vm extr frag 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+advise [advise] never
   enabled [always] advise 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 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)

------------------------------------------------------------
20. Disk information
   SPEC is set to: /home/CPU2017
   Filesystem Type Size Used Avail Use% Mounted on
   (Continued on next page)
Platform Notes (Continued)
/dev/mapper/rhel-home xfs 372G 183G 189G 50% /home

21. /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL320 Gen11
Product Family: ProLiant
Serial: CNX2210H28

22. 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:
4x Hynix HMCG88AEBRA168N 32 GB 2 rank 4800, configured at 4400
4x Hynix HMCG88MEBRA113N 32 GB 2 rank 4800, configured at 4400

23. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: HPE
BIOS Version: 1.40
BIOS Date: 05/18/2023
BIOS Revision: 1.40
Firmware Revision: 1.20

Compiler Version Notes
C                               | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_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++                              | 508.namd_r(base, peak) 510.parest_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++, C                         | 511.povray_r(base, peak) 526.blender_r(base, peak)
-------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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C++, C, Fortran             | 507.cactuBSSN_r(base, peak)
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SPECrates®

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Test Date: Jun-2023
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Software Availability: Dec-2022

Compiler Version Notes (Continued)

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------------------------------------------------------------------------------------------------------------

Fortran  | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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Fortran, C  | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifix

Benchmarks using both Fortran and C:
ifix icx

Benchmarks using both C and C++:
icpx icx

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64

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## Base Portability Flags (Continued)

510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.ibm_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`  
- `flto -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 -flto -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 -flto`  
- `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`  
- `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`

### Benchmarks using both C and C++:
- `w -std=c++14 -m64 -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`  
- `ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL320 Gen11
(2.90 GHz, Intel Xeon Gold 5415+)

SPECrate®2017_fp_base = 131
SPECrate®2017_fp_peak = 133

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

Test Date: Jun-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

## Base Optimization Flags (Continued)

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`
- `538.imagick_r:basepeak = yes`

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SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL320 Gen11
(2.90 GHz, Intel Xeon Gold 5415+)

SPECrate®2017_fp_base = 131
SPECrate®2017_fp_peak = 133

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<td>Hardware Availability: May-2023</td>
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<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Dec-2022</td>
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</tbody>
</table>

Peak Optimization Flags (Continued)

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_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: -w -std=c++14 -m64 -std=c11 -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 -gopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512 -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL320 Gen11  
(2.90 GHz, Intel Xeon Gold 5415+)

| SPECrate®2017_fp_base = 131 |
| SPECrate®2017_fp_peak = 133 |

| Test Date: | Jun-2023 |
| Hardware Availability: | May-2023 |
| Software Availability: | Dec-2022 |

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

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev2.1.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev2.1.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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

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