SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

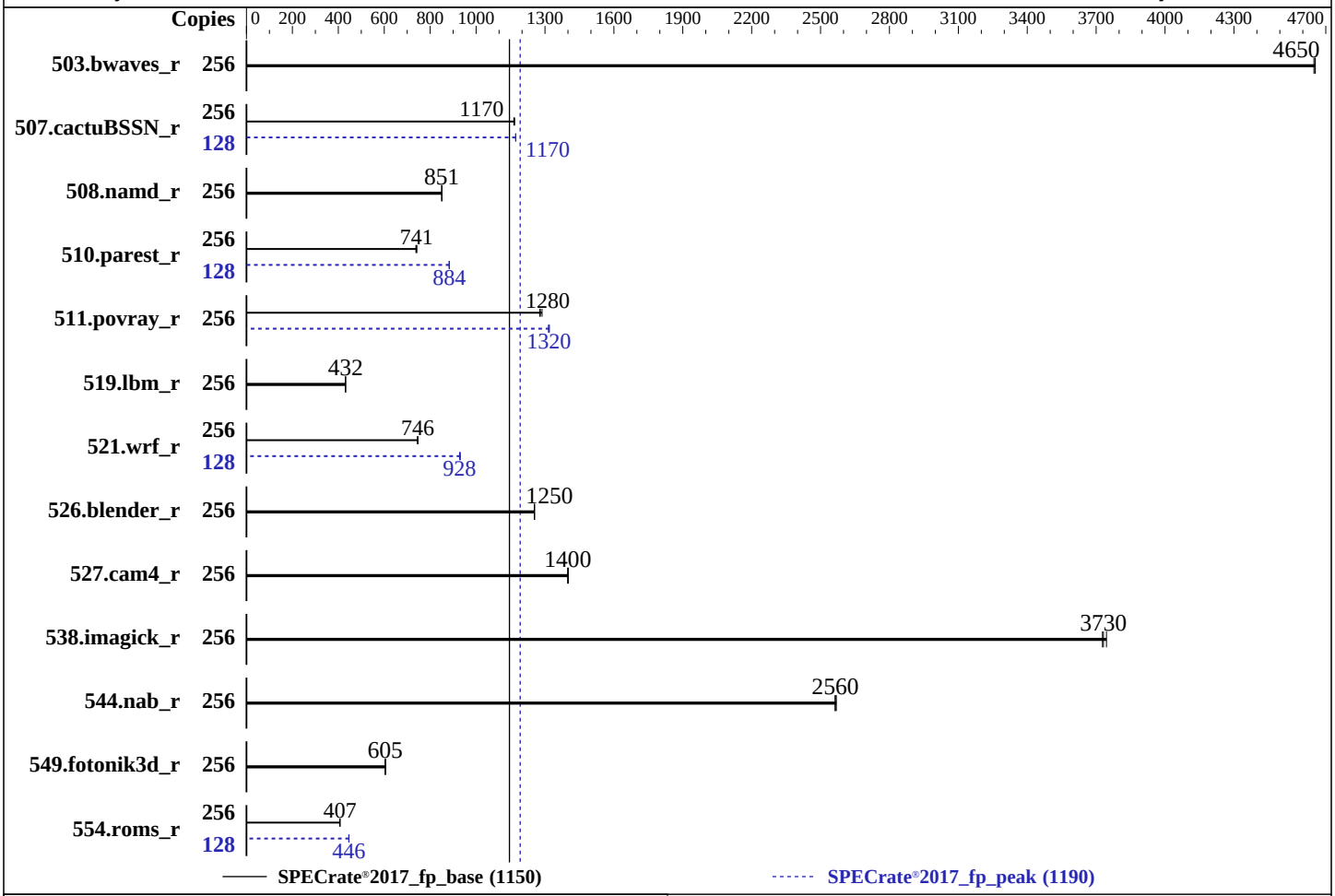
ProLiant DL360 Gen11
(1.90 GHz, Intel Xeon Platinum 8592+)

SPECrate®2017_fp_base = 1150

SPECrate®2017_fp_peak = 1190

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

Test Date: Nov-2023
Hardware Availability: Feb-2024
Software Availability: Dec-2023



Hardware

CPU Name:	Intel Xeon Platinum 8592+
Max MHz:	3900
Nominal:	1900
Enabled:	128 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:	320 MB I+D on chip per chip
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx8 PC5-5600B-R)
Storage:	1 x 480 GB SATA SSD
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP5 Kernel 5.14.21-150500.53-default
Compiler:	C/C++: Version 2023.2 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2023.2 of Intel Fortran Compiler for Linux;
Parallel:	No
Firmware:	HPE BIOS Version v2.10 10/26/2023 released Oct-2023
File System:	btrfs
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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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	256	552	4650	**552**	**4650**	552	4650	256	552	4650	**552**	**4650**	552	4650
507.cactuBSSN_r	256	**278**	**1170**	278	1170	278	1160	128	**138**	**1170**	138	1170	138	1170
508.namd_r	256	286	850	**286**	**851**	286	851	256	286	850	**286**	**851**	286	851
510.parest_r	256	908	738	**904**	**741**	903	742	128	**379**	**884**	379	884	380	882
511.povray_r	256	464	1290	468	1280	**467**	**1280**	256	455	1310	453	1320	**454**	**1320**
519.lbm_r	256	625	432	**625**	**432**	626	431	256	625	432	**625**	**432**	626	431
521.wrf_r	256	768	746	770	745	**769**	**746**	128	308	932	**309**	**928**	309	928
526.blender_r	256	311	1250	311	1250	**311**	**1250**	256	311	1250	311	1250	**311**	**1250**
527.cam4_r	256	**320**	**1400**	319	1400	320	1400	256	**320**	**1400**	319	1400	320	1400
538.imagick_r	256	170	3750	171	3730	**171**	**3730**	256	170	3750	171	3730	**171**	**3730**
544.nab_r	256	**168**	**2560**	168	2570	168	2560	256	**168**	**2560**	168	2570	168	2560
549.fotonik3d_r	256	1646	606	1652	604	**1650**	**605**	256	1646	606	1652	604	**1650**	**605**
554.roms_r	256	1002	406	**999**	**407**	998	408	128	455	447	**456**	**446**	456	446

SPECrate®2017_fp_base = 1150

SPECrate®2017_fp_peak = 1190

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 set to Throughput-Performance using "tuned-adm profile throughput-performance"
```

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
runcpu command invoked through numactl i.e.:
```

(Continued on next page)

General Notes (Continued)

```
 numactl --interleave=all runcpu <etc>
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
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
The system ROM used for this result contains Intel microcode version 0x210001a0 for
the Intel Xeon Platinum 8592+ 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
 Enhanced Processor Performance Profile set to Aggressive
 Thermal Configuration set to Maximum Cooling
 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 Thu Nov 16 08:13:05 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/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
 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 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
  x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   08:13:05 up 1 min,  0 users,  load average: 0.33, 0.11, 0.04
  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                 (-i) 2062369
  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) 2062369
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 29
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root@notty
 bash -c cd $SPEC/ && $SPEC/fprate.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 -c
   ic2023.2-lin-sapphirerapids-rate-20230622.cfg --define smt-on --define cores=128 --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=256 --configfile
   ic2023.2-lin-sapphirerapids-rate-20230622.cfg --define smt-on --define cores=128 --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) PLATINUM 8592+
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 207
    stepping        : 2
    microcode       : 0x210001a0
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
```

(Continued on next page)

Platform Notes (Continued)

```
     cpu cores       : 64
     siblings        : 128
     2 physical ids (chips)
     256 processors (hardware threads)
     physical id 0: core ids 0-63
     physical id 1: core ids 0-63
     physical id 0: apicids 0-127
     physical id 1: apicids 128-255
   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):                          256
   On-line CPU(s) list:             0-255
   Vendor ID:                       GenuineIntel
   Model name:                      INTEL(R) XEON(R) PLATINUM 8592+
   CPU family:                      6
   Model:                           207
   Thread(s) per core:              2
   Core(s) per socket:              64
   Socket(s):                       2
   Stepping:                        2
   BogoMIPS:                        3800.00
   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
                                    invpcid_single cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                                    vnmi 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 avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts
                                    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 avx512_fp16 amx_tile flush_l1d arch_capabilities
   Virtualization:                  VT-x
   L1d cache:                       6 MiB (128 instances)
   L1i cache:                       4 MiB (128 instances)
   L2 cache:                        256 MiB (128 instances)
   L3 cache:                        640 MiB (2 instances)
   NUMA node(s):                    4
   NUMA node0 CPU(s):               0-31,128-159
   NUMA node1 CPU(s):               32-63,160-191
   NUMA node2 CPU(s):               64-95,192-223
   NUMA node3 CPU(s):               96-127,224-255
   Vulnerability Itlb multihit:     Not affected
   Vulnerability L1tf:              Not affected
   Vulnerability Mds:               Not affected
```

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Platform Notes (Continued)

```
  Vulnerability Meltdown:          Not affected
  Vulnerability Mmio stale data:   Not affected
  Vulnerability Retbleed:          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, PBRSB-eIBRS SW
                                   sequence
  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       6M   12 Data            1     64        1             64
     L1i       32K       4M    8 Instruction     1     64        1             64
     L2         2M     256M   16 Unified         2   2048        1             64
     L3       320M     640M   20 Unified         3 262144        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: 0-31,128-159
  node 0 size: 128667 MB
  node 0 free: 127957 MB
  node 1 cpus: 32-63,160-191
  node 1 size: 129008 MB
  node 1 free: 128499 MB
  node 2 cpus: 64-95,192-223
  node 2 size: 129008 MB
  node 2 free: 128536 MB
  node 3 cpus: 96-127,224-255
  node 3 size: 128933 MB
  node 3 free: 128393 MB
  node distances:
  node   0   1   2   3
    0:  10  20  30  30
    1:  20  10  30  30
    2:  30  30  10  20
    3:  30  30  20  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       527991284 kB

------------------------------------------------------------
10. who -r
  run-level 3 Nov 16 08:12

------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          apparmor auditd cron getty@ irqbalance issue-generator kbdsettings lvm2-monitor postfix
                   purge-kernels rollback sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4
                   wickedd-dhcp6 wickedd-nanny
  enabled-runtime  systemd-remount-fs
```

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Platform Notes (Continued)

```
  disabled         blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell
                   grub2-once haveged haveged-switch-root hwloc-dump-hwdata issue-add-ssh-keys kexec-load
                   lunmask rpmconfigcheck serial-getty@ systemd-boot-check-no-failures
                   systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned
  indirect         wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
  root=UUID=cc6cc077-0be5-45b2-9254-52358283bcfe
  splash=silent
  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. tuned-adm active
  Current active profile: throughput-performance

------------------------------------------------------------
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                      10
  vm.watermark_boost_factor       15000
  vm.watermark_scale_factor          10
  vm.zone_reclaim_mode                0

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

------------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
```

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Platform Notes (Continued)

```
   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 SP5

 ------------------------------------------------------------
 20. Disk information
 SPEC is set to: /home/cpu2017
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/sdb2      btrfs  371G  143G  228G  39% /home

 ------------------------------------------------------------
 21. /sys/devices/virtual/dmi/id
     Vendor:          HPE
     Product:         ProLiant DL360 Gen11
     Product Family: ProLiant
     Serial:          CNX2070DC4

 ------------------------------------------------------------
 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:
     16x Hynix HMCG88AGBRA193N 32 GB 2 rank 5600


 ------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       HPE
    BIOS Version:      2.10
    BIOS Date:         10/26/2023
    BIOS Revision:     2.10
    Firmware Revision: 1.50
```

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 2023.2.0 Build 20230622
Copyright (C) 1985-2023 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 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================================================
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 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 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 2023.2.0 Build 20230622
Copyright (C) 1985-2023 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 2023.2.0 Build 20230622
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
Copyright (C) 1985-2023 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

(Continued on next page)

Base Compiler Invocation (Continued)

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

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
-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

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-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

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`

544.nab_r: `basepeak = yes`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `-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:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `-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:

521.wrf_r: `-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`

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`

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Peak Optimization Flags (Continued)

511.povray_r (continued):
-funroll-loops -qopt-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++:
-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

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-rev3.0.html
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-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-rev3.0.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-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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