SPEC CPU®2017 Floating Point Rate Result

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Supermicro

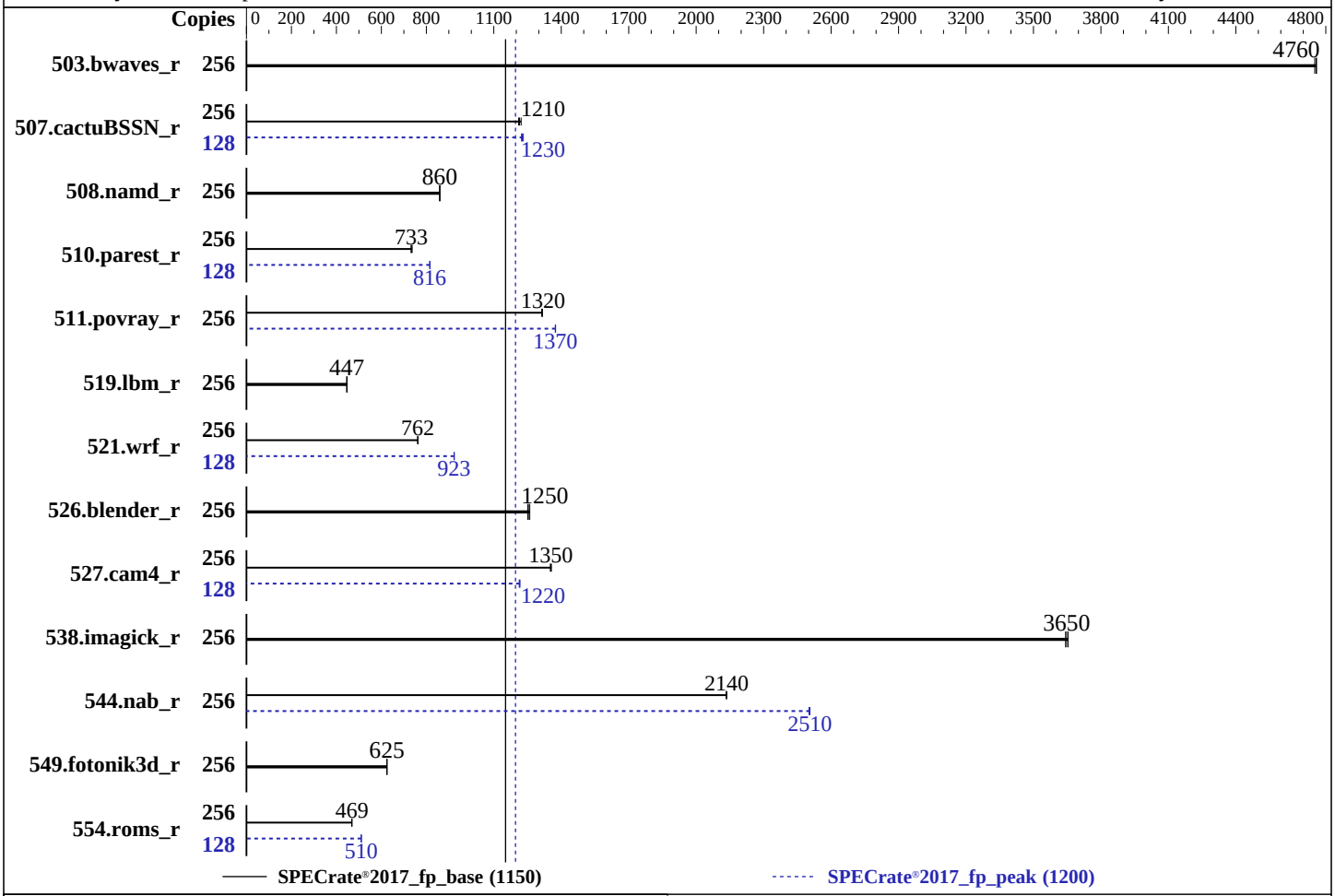
GPU SuperServer SYS-741GE-TNRT
(X13DEG-QT , Intel Xeon Platinum 8592+)

SPECrate®2017_fp_base = 1150

SPECrate®2017_fp_peak = 1200

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Nov-2023
Hardware Availability: Dec-2023
Software Availability: Jun-2023



Hardware

CPU Name:	Intel Xeon Platinum 8592+
Max MHz:	3900
Nominal:	1900
Enabled:	128 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
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:	1 TB (16 x 64 GB 2Rx4 PC5-5600B-R)
Storage:	1 x 512 GB M.2 NVMe 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:	Version 2.0 released Nov-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 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	539	4760	540	4750	**540**	**4760**	256	539	4760	540	4750	**540**	**4760**
507.cactuBSSN_r	256	265	1220	268	1210	**267**	**1210**	128	**132**	**1230**	132	1220	132	1230
508.namd_r	256	283	859	**283**	**860**	283	860	256	283	859	**283**	**860**	283	860
510.parest_r	256	915	732	**913**	**733**	909	737	128	411	815	410	816	**411**	**816**
511.povray_r	256	**454**	**1320**	454	1320	455	1310	256	**435**	**1370**	435	1370	435	1370
519.lbm_r	256	604	447	**604**	**447**	604	446	256	604	447	**604**	**447**	604	446
521.wrf_r	256	752	763	**752**	**762**	753	761	128	310	924	**310**	**923**	310	923
526.blender_r	256	**311**	**1250**	312	1250	309	1260	256	**311**	**1250**	312	1250	309	1260
527.cam4_r	256	331	1350	**331**	**1350**	330	1360	128	184	1220	**184**	**1220**	185	1210
538.imagick_r	256	**175**	**3650**	174	3650	175	3640	256	**175**	**3650**	174	3650	175	3640
544.nab_r	256	202	2140	202	2130	**202**	**2140**	256	172	2500	**172**	**2510**	172	2510
549.fotonik3d_r	256	1598	624	1596	625	**1596**	**625**	256	1598	624	1596	625	**1596**	**625**
554.roms_r	256	868	469	867	469	**868**	**469**	128	399	510	**398**	**510**	398	511

SPECrate®2017_fp_base = 1150

SPECrate®2017_fp_peak = 1200

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"
```

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
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>

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
```

(Continued on next page)

General Notes (Continued)

```
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

```
BIOS Settings:
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Extreme Performance
DCU Streamer Prefetcher = Disable
SNC = Enable SNC2 (2-clusters)
LLC Dead Line Alloc = Disable
KTI Prefetch = Enable
Stale AtoS = Disable
Patrol Scrub = Disable

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on 135-174-176 Fri Nov 17 20:46:44 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/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. 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 135-174-176 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
```

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Platform Notes (Continued)

```
------------------------------------------------------------
2. w
   20:46:44 up 1 day,  5:57,  2 users,  load average: 173.92, 234.94, 246.01
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                Thu14    6:28m  1.14s  0.01s -bash
  root     tty2     -                09:31    5:20m  0.13s  0.13s -bash

------------------------------------------------------------
3. Username
  From environment variable $USER:  root

------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 4126494
  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) 4126494
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 30
 login -- root
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 -c
   ic2023.2-lin-core-avx512-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-core-avx512-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/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --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
    cpu cores       : 64
    siblings        : 128
    2 physical ids (chips)
```

(Continued on next page)

Platform Notes (Continued)

```
     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
   Vulnerability Meltdown:          Not affected
   Vulnerability Mmio stale data:   Not affected
   Vulnerability Retbleed:          Not affected
```

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Platform Notes (Continued)

```
  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: 257633 MB
  node 0 free: 228216 MB
  node 1 cpus: 32-63,160-191
  node 1 size: 258031 MB
  node 1 free: 232282 MB
  node 2 cpus: 64-95,192-223
  node 2 size: 258031 MB
  node 2 free: 232891 MB
  node 3 cpus: 96-127,224-255
  node 3 size: 257957 MB
  node 3 free: 232847 MB
  node distances:
  node   0   1   2   3
    0:  10  12  21  21
    1:  12  10  21  21
    2:  21  21  10  12
    3:  21  21  12  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1056414172 kB

------------------------------------------------------------
10. who -r
  run-level 3 Nov 16 14:49

------------------------------------------------------------
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          YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ irqbalance
                   issue-generator kbdsettings klog lvm2-monitor nscd nvmefc-boot-connections postfix
                   purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked wickedd-auto4
                   wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
  enabled-runtime  systemd-remount-fs
  disabled         autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
```

(Continued on next page)

Platform Notes (Continued)

```
                  firewalld gpm grub2-once haveged haveged-switch-root ipmi ipmievd issue-add-ssh-keys
                  kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nvmf-autoconnect rpcbind
                  rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd
                  systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                  systemd-time-wait-sync systemd-timesyncd udisks2 vncserver@
  indirect        wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
  root=UUID=9de9855c-b179-4e5b-8330-3742dedc18b2
  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. sysctl
  kernel.numa_balancing              1
  kernel.randomize_va_space          2
  vm.compaction_proactiveness       20
  vm.dirty_background_bytes          0
  vm.dirty_background_ratio         10
  vm.dirty_bytes                     0
  vm.dirty_expire_centisecs       3000
  vm.dirty_ratio                    20
  vm.dirty_writeback_centisecs     500
  vm.dirtytime_expire_seconds    43200
  vm.extfrag_threshold             500
  vm.min_unmapped_ratio              1
  vm.nr_hugepages                    0
  vm.nr_hugepages_mempolicy          0
  vm.nr_overcommit_hugepages         0
  vm.swappiness                     60
  vm.watermark_boost_factor      15000
  vm.watermark_scale_factor         10
  vm.zone_reclaim_mode               0

------------------------------------------------------------
16. /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

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

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Platform Notes (Continued)

```
  pages_to_scan            4096
  scan_sleep_millisecs    10000

------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP5

------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p2 xfs   475G  105G  370G  23% /

------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:          Supermicro
    Product:         Super Server
    Product Family: Family
    Serial:          0123456789

------------------------------------------------------------
21. 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:
    14x SK Hynix HMCG94AGBRA181N 64 GB 2 rank 5600
    2x SK Hynix HMCG94AGBRA184N 64 GB 2 rank 5600


------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       American Megatrends International, LLC.
   BIOS Version:      2.0
   BIOS Date:         11/13/2023
   BIOS Revision:     5.32
```

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.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C          | 511.povray_r(base, peak) 526.blender_r(base, peak)
--------------------------------------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
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
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.0 Build 20230622
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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

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 -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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 -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -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 -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
`-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int -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: `-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops`

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Peak Optimization Flags (Continued)

544.nab_r (continued):
-qopt-mem-layout-trans=4 -Wno-implicit-int
-qopt-zmm-usage=high -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -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 -xCORE-AVX512 -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 -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -nostandard-realloc-lhs -align array32byte -auto
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

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 -qopt-mem-layout-trans=4 -Wno-implicit-int
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops

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Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-qopt-mem-layout-trans=4 -Wno-implicit-int -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/Intel-ic2023p2-official-linux64.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-EMR-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-EMR-revA.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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