SPEC CPU®2017 Floating Point Rate Result

New H3C Technologies Co., Ltd.

H3C UniServer R4900 G6 (Intel Xeon Gold 6530)

SPECrate®2017_fp_base =   769

SPECrate®2017_fp_peak = Not Run

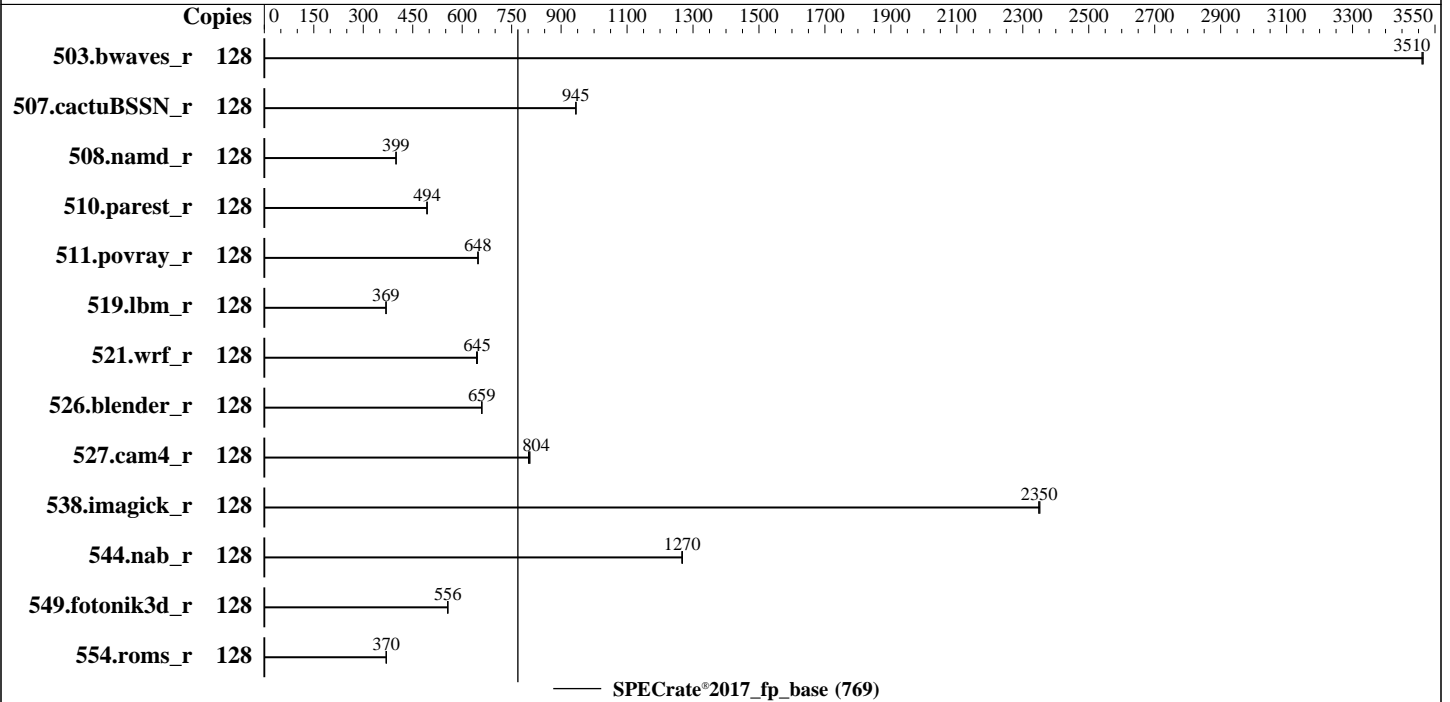|	
CPU2017 License: 9066	**Test Date:** Aug-2024
Test Sponsor: New H3C Technologies Co., Ltd.	**Hardware Availability:** Oct-2023
Tested by: New H3C Technologies Co., Ltd.	**Software Availability:** Mar-2024

Copies — scale: 0 150 300 450 600 750 900 1100 1300 1500 1700 1900 2100 2300 2500 2700 2900 3100 3300 3550

Benchmark	Copies	Result
503.bwaves_r	128	3510
507.cactuBSSN_r	128	945
508.namd_r	128	399
510.parest_r	128	494
511.povray_r	128	648
519.lbm_r	128	369
521.wrf_r	128	645
526.blender_r	128	659
527.cam4_r	128	804
538.imagick_r	128	2350
544.nab_r	128	1270
549.fotonik3d_r	128	556
554.roms_r	128	370

SPECrate®2017_fp_base (769)

Hardware

CPU Name: Intel Xeon Gold 6530
 Max MHz: 4000
 Nominal: 2100
Enabled: 64 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: 160 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-6400B-R, running at 4800)
Storage: 1 x 3.2 TB NVME SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise High Performance Computing 15 SP5
5.14.21-150500.53-default

Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;

Parallel: No
Firmware: Version 6.10.38P60 released Apr-2024 BIOS
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
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 Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	128	**366**	**3510**	366	3510	365	3510							
507.cactuBSSN_r	128	171	945	172	945	**172**	**945**							
508.namd_r	128	**304**	**399**	304	399	304	400							
510.parest_r	128	678	494	**678**	**494**	680	493							
511.povray_r	128	461	649	**461**	**648**	462	648							
519.lbm_r	128	**365**	**369**	366	369	365	369							
521.wrf_r	128	**444**	**645**	444	646	446	644							
526.blender_r	128	**296**	**659**	295	660	296	659							
527.cam4_r	128	278	806	**278**	**804**	279	801							
538.imagick_r	128	135	2350	136	2350	**135**	**2350**							
544.nab_r	128	170	1270	170	1270	**170**	**1270**							
549.fotonik3d_r	128	896	557	897	556	**896**	**556**							
554.roms_r	128	550	369	550	370	**550**	**370**							

SPECrate®2017_fp_base = **769**

SPECrate®2017_fp_peak = **Not Run**

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/speccpunew/lib/intel64:/home/speccpunew/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)
is mitigated in the system as tested and documented.

(Continued on next page)

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Test Date: Aug-2024
Hardware Availability: Oct-2023
Software Availability: Mar-2024

General Notes (Continued)

```
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:
SNC = Enable SNC2 (2-clusters)
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Performance

 Sysinfo program /home/speccpunew/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Sun Aug  4 01:35:50 2024

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


 ------------------------------------------------------------
 1. uname -a
   Linux localhost 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043/lp)
   x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
    01:35:50 up  3:12,  2 users,  load average: 76.02, 115.89, 124.38
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     -                22:24    3:09m  0.89s  0.00s sh intrate.sh
```

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Platform Notes (Continued)

```
   root     pts/0     172.16.27.225    22:25    3:09m  9.06s  0.00s sh 6530.sh

    ------------------------------------------------------------
    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) 4124621
      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) 4124621
      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
     sh intrate.sh
     runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
      ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=64 --define physicalfirst
      --define invoke_with_interleave --define drop_caches --tune base -o all fprate
     runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
      ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=64 --define physicalfirst
      --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
      rate --tune base --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/speccpunew


    ------------------------------------------------------------
    6. /proc/cpuinfo
        model name      : INTEL(R) XEON(R) GOLD 6530
        vendor_id       : GenuineIntel
        cpu family      : 6
        model           : 207
        stepping        : 2
        microcode       : 0x21000200
        bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
        cpu cores       : 32
        siblings        : 64
        2 physical ids (chips)
        128 processors (hardware threads)
        physical id 0: core ids 0-31
        physical id 1: core ids 0-31
        physical id 0: apicids 0-63
        physical id 1: apicids 128-191
      Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
```

(Continued on next page)

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Platform Notes (Continued)

```
   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:                52 bits physical, 57 bits virtual
  Byte Order:                   Little Endian
  CPU(s):                       128
  On-line CPU(s) list:          0-127
  Vendor ID:                    GenuineIntel
  Model name:                   INTEL(R) XEON(R) GOLD 6530
  CPU family:                   6
  Model:                        207
  Thread(s) per core:           2
  Core(s) per socket:           32
  Socket(s):                    2
  Stepping:                     2
  CPU max MHz:                  4000.0000
  CPU min MHz:                  800.0000
  BogoMIPS:                     4200.00
  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 hwp
                                hwp_act_window hwp_epp hwp_pkg_req 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:                    3 MiB (64 instances)
  L1i cache:                    2 MiB (64 instances)
  L2 cache:                     128 MiB (64 instances)
  L3 cache:                     320 MiB (2 instances)
  NUMA node(s):                 4
  NUMA node0 CPU(s):            0-15,64-79
  NUMA node1 CPU(s):            16-31,80-95
  NUMA node2 CPU(s):            32-47,96-111
  NUMA node3 CPU(s):            48-63,112-127
  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
  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
```

(Continued on next page)

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Software Availability: Mar-2024

Platform Notes (Continued)

```
                                  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       3M   12 Data             1      64        1             64
      L1i       32K       2M    8 Instruction      1      64        1             64
      L2         2M     128M   16 Unified          2    2048        1             64
      L3       160M     320M   20 Unified          3  131072        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: 0-15,64-79
  node 0 size: 257543 MB
  node 0 free: 247642 MB
  node 1 cpus: 16-31,80-95
  node 1 size: 258005 MB
  node 1 free: 250383 MB
  node 2 cpus: 32-47,96-111
  node 2 size: 258039 MB
  node 2 free: 250326 MB
  node 3 cpus: 48-63,112-127
  node 3 size: 257597 MB
  node 3 free: 249151 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:       1055934792 kB

  -------------------------------------------------------------
10. who -r
   run-level 3 Aug 3 22:24

  -------------------------------------------------------------
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 firewalld getty@
                    irqbalance issue-generator kbdsettings kdump kdump-early 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 dmraid-activation ebtables
                    exchange-bmc-os-info gpm grub2-once haveged haveged-switch-root ipmi ipmievd irqbindall
                    issue-add-ssh-keys kexec-load ksm kvm_stat lunmask man-db-create multipathd nfs nfs-blkmap
                    nvmf-autoconnect rpcbind rpmconfigcheck rsyncd serial-getty@ set_kthread_prio
```

(Continued on next page)

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Platform Notes (Continued)

```
                    smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures
                    systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned
                    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=4607dbe1-932d-4bea-b43c-6701598385ba
  splash=silent
  resume=/dev/disk/by-uuid/2ccfd1c4-5b7d-4cdb-9370-aca95a4f79b6
  mitigations=auto
  quiet
  security=apparmor
  crashkernel=403M,high
  crashkernel=72M,low


    ----------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 4.00 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    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                  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
```

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Platform Notes (Continued)

```
      ----------------------------------------------------------------
      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 SUSE Linux Enterprise High Performance Computing 15 SP5

      ----------------------------------------------------------------
      20. Disk information
      SPEC is set to: /home/speccpunew
        Filesystem     Type  Size  Used Avail Use% Mounted on
        /dev/nvme0n1p3 xfs   1.0T  343G  681G  34% /home

      ----------------------------------------------------------------
      21. /sys/devices/virtual/dmi/id
          Vendor:        H3C
          Product:       H3C UniServer R4900 G6
          Product Family: Rack
          Serial:        210235A4HEH242000011

      ----------------------------------------------------------------
      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 HMCG94AHBRA487N 64 GB 2 rank 6400, configured at 4800

      ----------------------------------------------------------------
      23. BIOS
      (This section combines info from /sys/devices and dmidecode.)
        BIOS Vendor:      American Megatrends International, LLC.
        BIOS Version:     6.10.38P60
        BIOS Date:        04/03/2024
        BIOS Revision:    5.32
```

Compiler Version Notes

```
==============================================================================
C            | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++          | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
```

(Continued on next page)

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Compiler Version Notes (Continued)

```
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------------------


==================================================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base)
-----------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------------------


==================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
-----------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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==================================================================================================
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
-----------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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==================================================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
-----------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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-----------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

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New H3C Technologies Co., Ltd.

H3C UniServer R4900 G6 (Intel Xeon Gold 6530)

SPECrate®2017_fp_base =   769

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9066		**Test Date:**	Aug-2024
Test Sponsor:	New H3C Technologies Co., Ltd.	**Hardware Availability:**	Oct-2023
Tested by:	New H3C Technologies Co., Ltd.	**Software Availability:**	Mar-2024

Base Compiler Invocation (Continued)

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 -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
```

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Base Optimization Flags (Continued)

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
```

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/Intel-ic2024-official-linux64.html
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.0-SPR-RevE.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.0-SPR-RevE.xml
```

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

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