SPEC CPU®2017 Floating Point Rate Result

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_fp_base = 962

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Apr-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Benchmark	Copies	Result
503.bwaves_r	144	4180
507.cactuBSSN_r	144	1270
508.namd_r	144	471
510.parest_r	144	518
511.povray_r	144	753
519.lbm_r	144	524
521.wrf_r	144	895
526.blender_r	144	762
527.cam4_r	144	892
538.imagick_r	144	2610
544.nab_r	144	1490
549.fotonik3d_r	144	1020
554.roms_r	144	492

SPECrate®2017_fp_base (962)

Hardware

CPU Name: Intel Xeon Gold 6416H
 Max MHz: 4200
 Nominal: 2200
Enabled: 72 cores, 4 chips, 2 threads/core
Orderable: 2,4 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 45 MB I+D on chip per chip
 Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 960 GB SATA SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
5.14.0-70.13.1.el9_0.x86_64
Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 04.24.01.10 released Mar-2024
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.

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

SPEC CPU®2017 Floating Point Rate Result
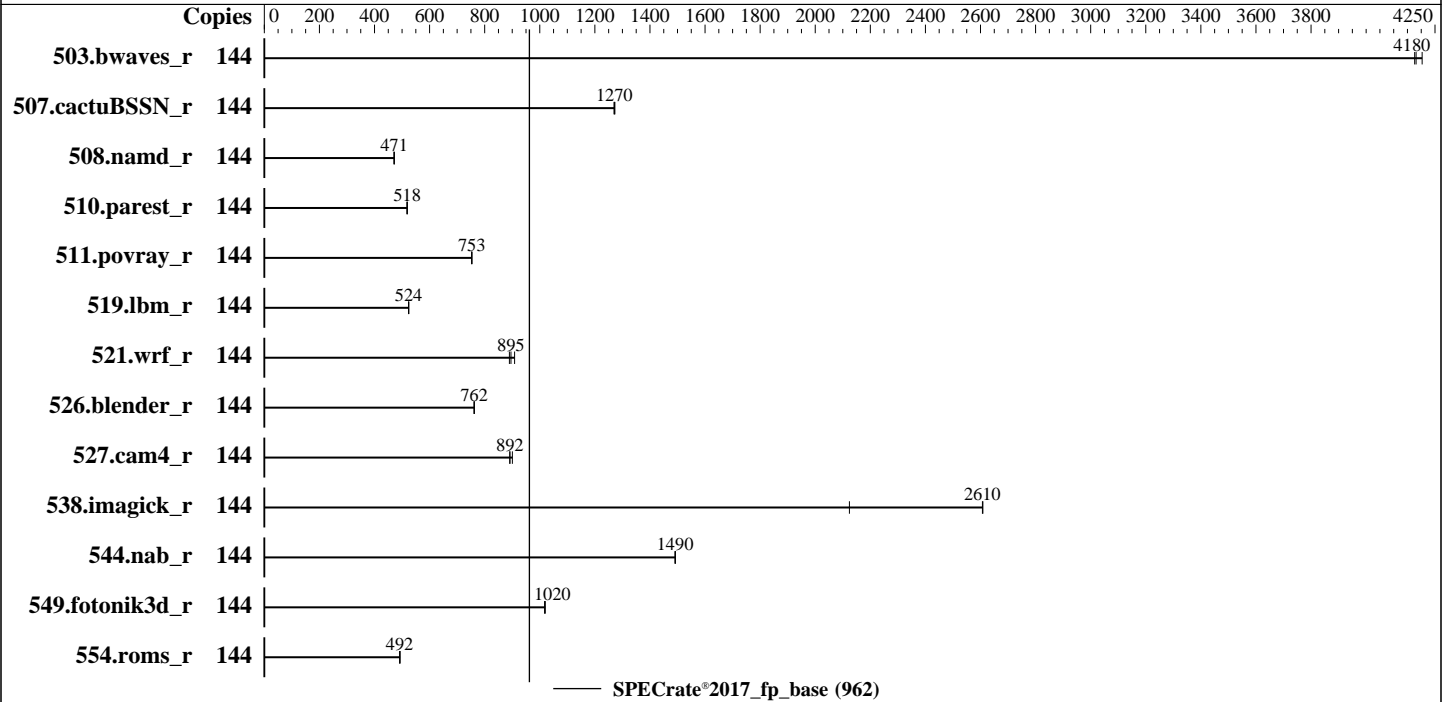Copyright 2017-2024 Standard Performance Evaluation Corporation

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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	144	344	4200	346	4180	**345**	**4180**							
507.cactuBSSN_r	144	**143**	**1270**	144	1270	143	1270							
508.namd_r	144	**290**	**471**	290	472	290	471							
510.parest_r	144	726	519	727	518	**727**	**518**							
511.povray_r	144	447	753	**446**	**753**	446	753							
519.lbm_r	144	290	524	**290**	**524**	290	524							
521.wrf_r	144	363	890	355	909	**360**	**895**							
526.blender_r	144	288	762	**288**	**762**	288	762							
527.cam4_r	144	280	900	283	891	**282**	**892**							
538.imagick_r	144	169	2120	137	2610	**137**	**2610**							
544.nab_r	144	**162**	**1490**	163	1490	162	1490							
549.fotonik3d_r	144	**551**	**1020**	551	1020	550	1020							
554.roms_r	144	466	491	464	493	**466**	**492**							

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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"
OS set to performance mode via cpupower frequency-set -g 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
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)

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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 Configuration:
ENERGY_PERF_BIAS_CFG mode = performance
LLC dead line alloc = Disabled
Patrol Scrub = Disabled
Intel VT for Directed I/O (VT-d) = Disabled
SR-IOV Support = Disabled
Sub NUMA(SNC) = Enable SNC4

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Mon Apr 29 15:18:43 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 250 (250-6.el9_0)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS
-----------------------------------------------------------


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

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Platform Notes (Continued)

```
   15:18:43 up 1 min,  3 users,  load average: 0.32, 0.27, 0.10
 USER      TTY          LOGIN@   IDLE   JCPU   PCPU WHAT
 root      pts/0    15:17   1:20   0.00s  0.00s -bash
 root      pts/1    15:17   11.00s  0.77s  0.00s /bin/sh
 ./reportable-ic2024.0.2-lin-sapphirerapids-rate-smt-on-20231213.sh
 root      pts/2    15:18   0.00s  0.00s  0.00s -bash


-------------------------------------------------------------
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) 8253308
  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) 8253308
  virtual memory              (kbytes, -v) unlimited
  file locks                       (-x) unlimited


-------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 28
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root [priv]
 sshd: root@pts/1
 -bash
 /bin/sh ./reportable-ic2024.0.2-lin-sapphirerapids-rate-smt-on-20231213.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=144 -c
   ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=72 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base -o all fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=144 --configfile
   ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=72 --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/CPU2017.001/templogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


-------------------------------------------------------------
6. /proc/cpuinfo
    model name        : Intel(R) Xeon(R) Gold 6416H
    vendor_id         : GenuineIntel
    cpu family        : 6
    model             : 143
    stepping          : 8
    microcode         : 0x2b000571
    bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores         : 18
```

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Platform Notes (Continued)

```
      siblings        : 36
    4 physical ids (chips)
    144 processors (hardware threads)
    physical id 0: core ids 0-17
    physical id 1: core ids 0-17
    physical id 2: core ids 0-17
    physical id 3: core ids 0-17
    physical id 0: apicids 0-35
    physical id 1: apicids 128-163
    physical id 2: apicids 256-291
    physical id 3: apicids 384-419
  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):                   144
    On-line CPU(s) list:      0-143
    Vendor ID:                GenuineIntel
    BIOS Vendor ID:           Intel(R) Corporation
    Model name:               Intel(R) Xeon(R) Gold 6416H
    BIOS Model name:          Intel(R) Xeon(R) Gold 6416H
    CPU family:               6
    Model:                    143
    Thread(s) per core:       2
    Core(s) per socket:       18
    Socket(s):                4
    Stepping:                 8
    CPU max MHz:              4200.0000
    CPU min MHz:              800.0000
    BogoMIPS:                 4400.00
    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 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
                              intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced 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 xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                              cqm_mbm_total cqm_mbm_local split_lock_detect 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
    L1d cache:                3.4 MiB (72 instances)
    L1i cache:                2.3 MiB (72 instances)
    L2 cache:                 144 MiB (72 instances)
    L3 cache:                 180 MiB (4 instances)
    NUMA node(s):             8
    NUMA node0 CPU(s):        0-8,72-80
```

(Continued on next page)

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Platform Notes (Continued)

```
  NUMA node1 CPU(s):            9-17,81-89
  NUMA node2 CPU(s):            18-26,90-98
  NUMA node3 CPU(s):            27-35,99-107
  NUMA node4 CPU(s):            36-44,108-116
  NUMA node5 CPU(s):            45-53,117-125
  NUMA node6 CPU(s):            54-62,126-134
  NUMA node7 CPU(s):            63-71,135-143
  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
  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:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d      48K     3.4M  12 Data             1    64       1              64
      L1i      32K     2.3M   8 Instruction      1    64       1              64
      L2        2M     144M  16 Unified          2  2048       1              64
      L3       45M     180M  15 Unified          3 49152       1              64

  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-8,72-80
    node 0 size: 257115 MB
    node 0 free: 256602 MB
    node 1 cpus: 9-17,81-89
    node 1 size: 258043 MB
    node 1 free: 257631 MB
    node 2 cpus: 18-26,90-98
    node 2 size: 258043 MB
    node 2 free: 257683 MB
    node 3 cpus: 27-35,99-107
    node 3 size: 258007 MB
    node 3 free: 257151 MB
    node 4 cpus: 36-44,108-116
    node 4 size: 258043 MB
    node 4 free: 257685 MB
    node 5 cpus: 45-53,117-125
    node 5 size: 258043 MB
    node 5 free: 257797 MB
    node 6 cpus: 54-62,126-134
    node 6 size: 258043 MB
    node 6 free: 257258 MB
    node 7 cpus: 63-71,135-143
    node 7 size: 258024 MB
    node 7 free: 257148 MB
    node distances:
    node   0   1   2   3   4   5   6   7
      0:  10  12  21  21  21  21  21  21
      1:  12  10  21  21  21  21  21  21
      2:  21  21  10  12  21  21  21  21
      3:  21  21  12  10  21  21  21  21
      4:  21  21  21  21  10  12  21  21
      5:  21  21  21  21  12  10  21  21
```

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Platform Notes (Continued)

```
     6:  21  21  21  21  21  21  10  12
     7:  21  21  21  21  21  21  12  10


-------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       2112888072 kB


-------------------------------------------------------------
10. who -r
   run-level 3 Apr 29 15:17


-------------------------------------------------------------
11. Systemd service manager version: systemd 250 (250-6.el9_0)
   Default Target  Status
   multi-user      running


-------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE             UNIT FILES
   enabled           NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                     dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
                     nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd
                     systemd-network-generator udisks2
   enabled-runtime   systemd-remount-fs
   disabled          arp-ethers blk-availability chrony-wait console-getty cpupower debug-shell kvm_stat
                     man-db-restart-cache-update nftables rdisc rhsm rhsm-facts rpmdb-rebuild serial-getty@
                     sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext target
                     targetclid
   indirect          sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

-------------------------------------------------------------
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
   crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap

-------------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 800 MHz and 4.20 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
     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
```

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Platform Notes (Continued)

```
  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
  pages_to_scan            4096
  scan_sleep_millisecs    10000


  ---------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release     Red Hat Enterprise Linux 9.0 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
  system-release Red Hat Enterprise Linux release 9.0 (Plow)


  ---------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
  Filesystem          Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   819G   24G  796G   3% /home


  ---------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
  Vendor:        ZTE
  Product:       R8500 G5
  Product Family: Server
  Serial:        219413636851


  ---------------------------------------------------------------
21. dmidecode
  Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.
  The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
  determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
  "DMTF SMBIOS" standard.
  Memory:
    32x Samsung M321R8GA0BB0-CQKMG 64 GB 2 rank 4800


  ---------------------------------------------------------------
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Platform Notes (Continued)

```
   22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       American Megatrends Inc.
    BIOS Version:      04.24.01.10
    BIOS Date:         03/13/2024
    BIOS Revision:     4.24
```

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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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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 2024.0.2 Build 20231213
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==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
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------------------------------------------------------------------------------
```

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_fp_base = 962

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Apr-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

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 -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
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_fp_base = 962

SPECrate®2017_fp_peak = Not Run

CPU2017 License:	9061	**Test Date:**	Apr-2024
Test Sponsor:	ZTE Corporation	**Hardware Availability:**	Apr-2023
Tested by:	ZTE Corporation	**Software Availability:**	Dec-2023

Base Optimization Flags (Continued)

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
```

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-linux64.2024-05-21.html
http://www.spec.org/cpu2017/flags/ZTE-Platform-Settings-SPR-V1.10.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.2024-05-21.xml
http://www.spec.org/cpu2017/flags/ZTE-Platform-Settings-SPR-V1.10.xml

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

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