SPEC CPU®2017 Floating Point Rate Result

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Fujitsu

PRIMERGY RX1440 M2,
AMD EPYC 9124, 3.00 GHz

$SPECrate®2017\_fp\_base = 230$

$SPECrate®2017_fp_peak = $ Not Run

CPU2017 License: 19	**Test Date:** Feb-2024
Test Sponsor: Fujitsu	**Hardware Availability:** Feb-2024
Tested by: Fujitsu	**Software Availability:** Nov-2022

Benchmark	Copies	Result
503.bwaves_r	32	519
507.cactuBSSN_r	32	316
508.namd_r	32	134
510.parest_r	32	163
511.povray_r	32	197
519.lbm_r	32	176
521.wrf_r	32	228
526.blender_r	32	176
527.cam4_r	32	185
538.imagick_r	32	742
544.nab_r	32	290
549.fotonik3d_r	32	209
554.roms_r	32	120

SPECrate®2017_fp_base (230)

Hardware

CPU Name: AMD EPYC 9124
 Max MHz: 3700
 Nominal: 3000
Enabled: 16 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 64 MB I+D on chip per chip,
 16 MB shared / 4 cores
 Other: None
Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x SATA SSD, 3.84 TB
Other: Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
 5.14.0-70.13.1.el9_0.x86_64
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Fujitsu BIOS Version Version V5.0.0.27 R1.5.0 for
 D4130-A1x. Released May-2024
 tested as V5.0.0.27 R1.4.0 for D4130-A1x Jan-2024
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS set to prefer performance
 at the cost of additional power usage

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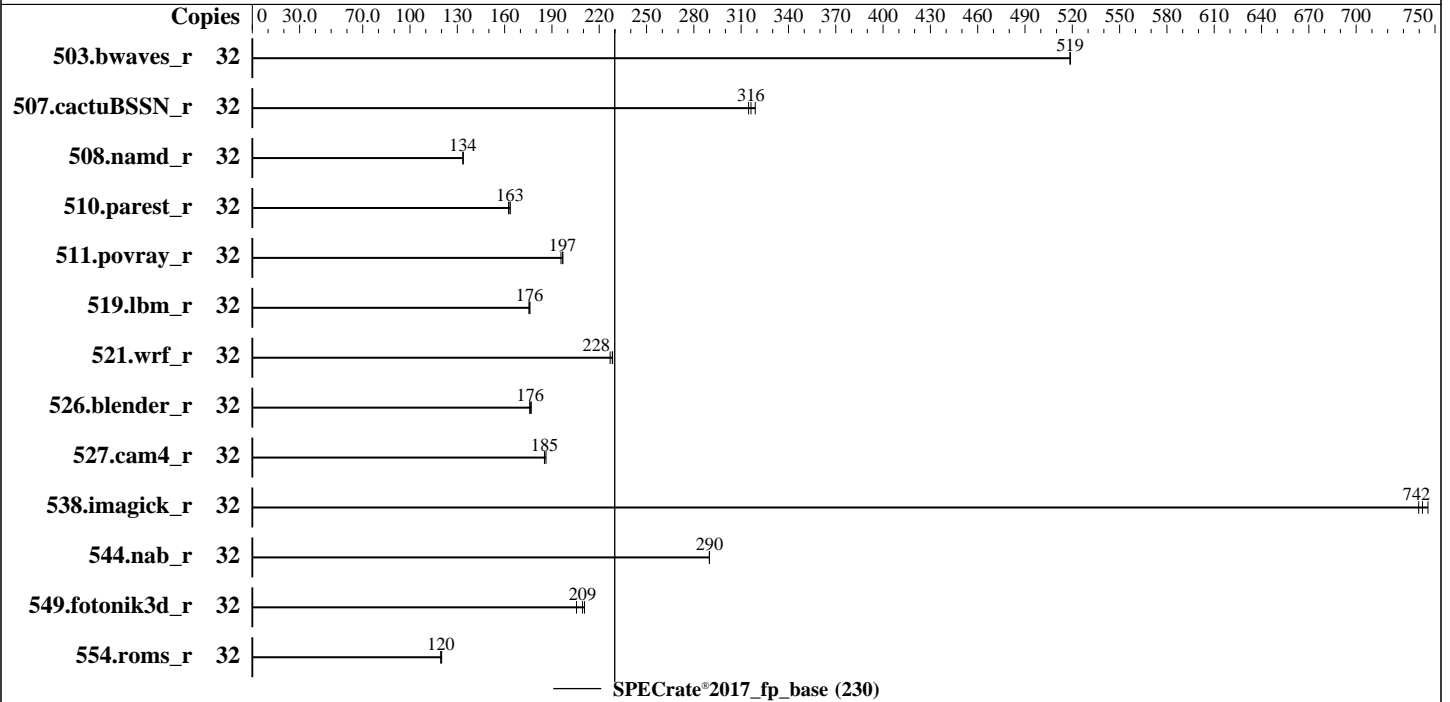
SPECrate®2017_fp_peak = Not Run

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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	32	**619**	**519**	618	519	619	519							
507.cactuBSSN_r	32	127	319	**128**	**316**	129	315							
508.namd_r	32	**228**	**134**	227	134	228	134							
510.parest_r	32	515	162	**512**	**163**	512	164							
511.povray_r	32	379	197	**380**	**197**	382	196							
519.lbm_r	32	192	175	192	176	**192**	**176**							
521.wrf_r	32	316	227	**314**	**228**	314	228							
526.blender_r	32	277	176	**276**	**176**	275	177							
527.cam4_r	32	301	186	**302**	**185**	302	185							
538.imagick_r	32	108	740	**107**	**742**	107	746							
544.nab_r	32	186	290	186	290	**186**	**290**							
549.fotonik3d_r	32	**595**	**209**	607	206	592	211							
554.roms_r	32	**425**	**120**	423	120	425	120							

SPECrate®2017_fp_base = 230

SPECrate®2017_fp_peak = Not Run

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

Compiler Notes

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations,

(Continued on next page)

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Operating System Notes (Continued)

```
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/home/Benchmark/speccpu2017r/amd_rate_aocc400_znver4_A_lib/lib:/home/Benchmark/speccpu2017r/amd_rate_
    aocc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Platform Notes

```
BIOS configuration:
Determinism Slider = Power
TDP Control = Manual
TDP Limit = 240
Package Power Limit Control = Manual
Package Power Limit = 240
Power Profile Selection = High Performance
NUMA nodes per socket = NPS4
Periodic Directory Rinse (PDR) Tuning = Cache-Bound
Fan Control = Full


 Sysinfo program /home/Benchmark/speccpu2017r/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Wed Feb 21 22:14:11 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
```

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Platform Notes (Continued)

```
  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
    22:14:11 up  1:40,  1 user,  load average: 0.00, 0.09, 5.00
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1       20:34    9.00s  1.13s  0.07s /bin/bash ./amd_rate_aocc400_znver4_A1.sh


  ----------------------------------------------------------
 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) 1543712
   max locked memory           (kbytes, -l) 2097152
   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) 1543712
   virtual memory              (kbytes, -v) unlimited
   file locks                       (-x) unlimited


  ----------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
  login -- root
  -bash
  -bash
  python3 ./run_amd_fprate_aocc400_znver4_A1.py
  /bin/bash ./amd_rate_aocc400_znver4_A1.sh
  runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 fprate
```

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

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Platform Notes (Continued)

```
 runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 --nopower
   --runmode rate --tune base --size test:train: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/Benchmark/speccpu2017r


 -----------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9124 16-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 17
    stepping        : 1
    microcode       : 0xa101144
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size        : 3584 4K pages
    cpu cores       : 16
    siblings        : 32
    1 physical ids (chips)
    32 processors (hardware threads)
    physical id 0: core ids 0-3,8-11,16-19,24-27
    physical id 0: apicids 0-7,16-23,32-39,48-55
 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:         52 bits physical, 57 bits virtual
  Byte Order:            Little Endian
  CPU(s):                32
  On-line CPU(s) list:   0-31
  Vendor ID:             AuthenticAMD
  BIOS Vendor ID:        Advanced Micro Devices, Inc.
  Model name:            AMD EPYC 9124 16-Core Processor
  BIOS Model name:       AMD EPYC 9124 16-Core Processor
  CPU family:            25
  Model:                 17
  Thread(s) per core:    2
  Core(s) per socket:    16
  Socket(s):             1
  Stepping:              1
  Frequency boost:       enabled
  CPU max MHz:           3711.9141
  CPU min MHz:           1500.0000
  BogoMIPS:              5990.95
  Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                         clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
                         constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rapl
                         pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
                         popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
                         abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                         perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
                         invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1
                         avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                         avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                         xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
```

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Platform Notes (Continued)

```
                                   avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
                                   svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                                   pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
                                   umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                   avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
  Virtualization:                  AMD-V
  L1d cache:                       512 KiB (16 instances)
  L1i cache:                       512 KiB (16 instances)
  L2 cache:                        16 MiB (16 instances)
  L3 cache:                        64 MiB (4 instances)
  NUMA node(s):                    4
  NUMA node0 CPU(s):               0-3,16-19
  NUMA node1 CPU(s):               4-7,20-23
  NUMA node2 CPU(s):               8-11,24-27
  NUMA node3 CPU(s):               12-15,28-31
  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; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, 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       32K     512K    8 Data            1    64        1             64
    L1i       32K     512K    8 Instruction     1    64        1             64
    L2         1M      16M    8 Unified         2  2048        1             64
    L3        16M      64M   16 Unified         3 16384        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: 0-3,16-19
  node 0 size: 95780 MB
  node 0 free: 95140 MB
  node 1 cpus: 4-7,20-23
  node 1 size: 96766 MB
  node 1 free: 96417 MB
  node 2 cpus: 8-11,24-27
  node 2 size: 96766 MB
  node 2 free: 96322 MB
  node 3 cpus: 12-15,28-31
  node 3 size: 96719 MB
  node 3 free: 96330 MB
  node distances:
  node   0   1   2   3
    0:  10  12  12  12
    1:  12  10  12  12
    2:  12  12  10  12
    3:  12  12  12  10

  ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:        395297840 kB
```

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Platform Notes (Continued)

```
   ----------------------------------------------------------
   10. who -r
     run-level 3 Feb 21 20:33


   ----------------------------------------------------------
   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 atd auditd bluetooth
                       crond dbus-broker firewalld getty@ insights-client-boot irqbalance iscsi iscsi-onboot
                       kdump libstoragemgmt lm_sensors lvm2-monitor mcelog mdmonitor microcode multipathd
                       nis-domainname nvmefc-boot-connections pmcd pmie pmlogger rhsmcertd rsyslog
                       selinux-autorelabel-mark smartd sshd sssd sysstat systemd-network-generator udisks2 upower
     enabled-runtime   rc-local systemd-remount-fs
     disabled          arp-ethers blk-availability canberra-system-bootup canberra-system-shutdown
                       canberra-system-shutdown-reboot chrony-wait chronyd cni-dhcp console-getty cpupower
                       debug-shell fancontrol grafana-server hwloc-dump-hwdata iprdump iprinit iprupdate ipsec
                       iscsid iscsiuio kpatch kvm_stat ledmon man-db-restart-cache-update nftables
                       nvmf-autoconnect pmfind pmie_farm pmlogger_farm pmproxy podman podman-auto-update
                       podman-restart postfix powertop psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts
                       rpmdb-rebuild rrdcached saslauthd serial-getty@ sshd-keygen@
                       systemd-boot-check-no-failures systemd-pstore systemd-sysext trace-cmd
     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=(hd1,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
     rhgb
     quiet


   ----------------------------------------------------------
   14. cpupower frequency-info
     analyzing CPU 0:
       current policy: frequency should be within 1.50 GHz and 3.00 GHz.
                       The governor "performance" may decide which speed to use
                       within this range.
       boost state support:
         Supported: yes
         Active: yes
         Boost States: 0
         Total States: 3
         Pstate-P0:  3000MHz


   ----------------------------------------------------------
   15. sysctl
     kernel.numa_balancing              1
     kernel.randomize_va_space          0
     vm.compaction_proactiveness        20
     vm.dirty_background_bytes          0
     vm.dirty_background_ratio          10
```

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Platform Notes (Continued)

```
  vm.dirty_bytes                       0
  vm.dirty_expire_centisecs         3000
  vm.dirty_ratio                       8
  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                        1
  vm.watermark_boost_factor        15000
  vm.watermark_scale_factor           10
  vm.zone_reclaim_mode                 1


  ----------------------------------------------------------
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/Benchmark/speccpu2017r
  Filesystem              Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   3.5T   43G  3.4T   2% /home


  ----------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:        FUJITSU
    Product:       PRIMERGY RX1440 M2
    Product Family: SERVER
    Serial:        xxxxxxxxxx


  ----------------------------------------------------------
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:
    12x Samsung M321R4GA3BB6-CQKEG 32 GB 2 rank 4800
```

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Platform Notes (Continued)

```
    ----------------------------------------------------------
    22. BIOS
    (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:       FUJITSU // American Megatrends Inc.
      BIOS Version:      V5.0.0.27 R1.4.0 for D4130-A1x
      BIOS Date:         01/30/2024
      BIOS Revision:     1.4
      Firmware Revision: 2.42
```

Compiler Version Notes

```
==============================================================================
C              | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++            | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++, C         | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
```

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Fujitsu

PRIMERGY RX1440 M2,
AMD EPYC 9124, 3.00 GHz

SPECrate®2017_fp_base = 230

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Feb-2024
Hardware Availability: Feb-2024
Software Availability: Nov-2022

Compiler Version Notes (Continued)

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

==============================================================================================
Fortran     | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
--------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------


==============================================================================================
Fortran, C  | 521.wrf_r(base) 527.cam4_r(base)
--------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Benchmarks using both Fortran and C:
`flang clang`

Benchmarks using both C and C++:
`clang++ clang`

Benchmarks using Fortran, C, and C++:
`clang++ clang flang`

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`

(Continued on next page)

Fujitsu

PRIMERGY RX1440 M2,
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Base Portability Flags (Continued)

508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
526.blender_r: `-funsigned-char -DSPEC_LP64`
527.cam4_r: `-DSPEC_CASE_FLAG -DSPEC_LP64`
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:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -lamdlibm -lamdalloc -lflang
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both Fortran and C:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

Fujitsu

PRIMERGY RX1440 M2,
AMD EPYC 9124, 3.00 GHz

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SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19	**Test Date:** Feb-2024
Test Sponsor: Fujitsu	**Hardware Availability:** Feb-2024
Tested by: Fujitsu	**Software Availability:** Nov-2022

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
```
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Benchmarks using both C and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Base Other Flags

C benchmarks:
```
-Wno-unused-command-line-argument
```

C++ benchmarks:
```
-Wno-unused-command-line-argument
```

Fortran benchmarks:
```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:
```
-Wno-unused-command-line-argument
```

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SPEC CPU®2017 Floating Point Rate Result

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PRIMERGY RX1440 M2,
AMD EPYC 9124, 3.00 GHz

SPECrate®2017_fp_base = 230

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19	**Test Date:** Feb-2024
Test Sponsor: Fujitsu	**Hardware Availability:** Feb-2024
Tested by: Fujitsu	**Software Availability:** Nov-2022

Base Other Flags (Continued)

Benchmarks using both C and C++:
```
-Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-Wno-unused-command-line-argument
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-Genoa-RevD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-Genoa-RevD.xml

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

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