SPEC CPU®2017 Floating Point Rate Result

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xFusion

FusionServer 1258H V7
(AMD EPYC 9554)

$SPECrate®2017\_fp\_base = 1240$

$SPECrate®2017\_fp\_peak = 1330$

CPU2017 License:	6488	
Test Sponsor:	xFusion	
Tested by:	xFusion	

Test Date:	Sep-2024
Hardware Availability:	Nov-2023
Software Availability:	Dec-2022

Copies

Benchmark	Copies	Value
503.bwaves_r	256	1770
507.cactuBSSN_r	256	1560
508.namd_r	256	1090
510.parest_r	256	820
	128	1330
511.povray_r	256	1590
		1600
519.lbm_r	256	624
521.wrf_r	256	970
	128	1190
526.blender_r	256	1370
		1380
527.cam4_r	256	1380
538.imagick_r	256	5890
544.nab_r	256	2340
		2340
549.fotonik3d_r	256	577
	128	582
554.roms_r	256	476
	128	566

SPECrate®2017_fp_base (1240) ———
SPECrate®2017_fp_peak (1330) ·······

Hardware

CPU Name:	AMD EPYC 9554
Max MHz:	3750
Nominal:	3100
Enabled:	128 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	256 MB I+D on chip per chip, 32 MB shared / 8 cores
Other:	None
Memory:	768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
Storage:	1 x 480 GB SATA SSD
Other:	CPU Cooling: Air

Software

OS:	Red Hat Enterprise Linux release 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:	Version 2.09.26 released Aug-2024
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other:	None
Power Management:	BIOS and OS set to prefer performance at the cost of additional power usage

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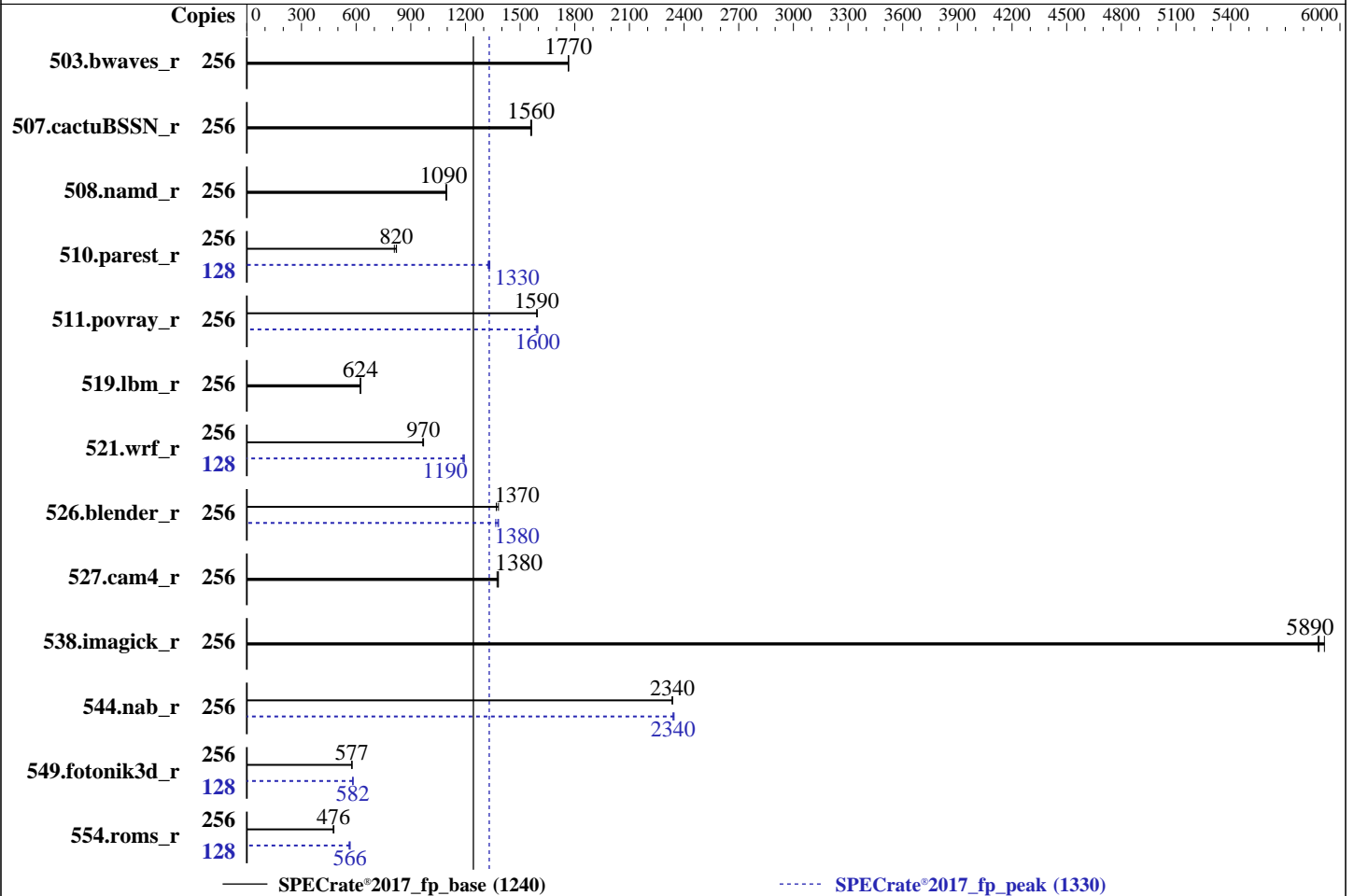SPECrate®2017_fp_peak = 1330

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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	1454	1770	**1454**	**1770**	1455	1760	256	1454	1770	**1454**	**1770**	1455	1760
507.cactuBSSN_r	256	207	1560	**208**	**1560**	208	1560	256	207	1560	**208**	**1560**	208	1560
508.namd_r	256	**222**	**1090**	222	1090	222	1100	256	**222**	**1090**	222	1090	222	1100
510.parest_r	256	**816**	**820**	827	810	815	821	128	251	1330	253	1320	**252**	**1330**
511.povray_r	256	375	1590	**375**	**1590**	376	1590	256	**375**	**1600**	374	1600	376	1590
519.lbm_r	256	**433**	**624**	432	624	433	624	256	**433**	**624**	432	624	433	624
521.wrf_r	256	**591**	**970**	591	970	594	965	128	**241**	**1190**	240	1190	242	1190
526.blender_r	256	282	1380	**284**	**1370**	285	1370	256	282	1380	**283**	**1380**	285	1370
527.cam4_r	256	324	1380	**325**	**1380**	326	1370	256	324	1380	**325**	**1380**	326	1370
538.imagick_r	256	**108**	**5890**	108	5910	108	5880	256	**108**	**5890**	108	5910	108	5880
544.nab_r	256	**184**	**2340**	184	2340	184	2340	256	184	2340	184	2350	**184**	**2340**
549.fotonik3d_r	256	**1730**	**577**	1730	577	1730	577	128	857	582	**857**	**582**	857	582
554.roms_r	256	858	474	**854**	**476**	851	478	128	359	566	362	561	**359**	**566**

SPECrate®2017_fp_base = **1240**

SPECrate®2017_fp_peak = **1330**

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 =
    "/cpu2017/amd_rate_aocc400_znver4_A_lib/lib:/cpu2017/amd_rate_aocc400_znver4_A_lib/lib32:/opt/openmpi/
    lib:"
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 settings:
 Determinism Control = Manual
 Determinism Enable = Power
 TDP Control = Manual
 TDP = 400
 PPT Control = Manual
 PPT = 400
 NUMA Nodes Per Socket = NPS4

 Sysinfo program /cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Fri Sep 27 14:32:33 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)
```

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Platform Notes (Continued)

```
 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.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
    14:32:33 up 2 min,  1 user,  load average: 1.09, 0.92, 0.39
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0     14:32   17.00s  1.17s  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) unlimited
   data seg size               (kbytes, -d) unlimited
   scheduling priority                 (-e) 0
   file size                   (blocks, -f) unlimited
   pending signals                     (-i) 6191057
   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) 6191057
   virtual memory              (kbytes, -v) unlimited
   file locks                          (-x) unlimited


 --------------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 30
  sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
  sshd: root [priv]
  sshd: root@pts/0
  -bash
  python3 ./run_amd_rate_aocc400_znver4_A1.py
  /bin/bash ./amd_rate_aocc400_znver4_A1.sh
  runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 fprate
  runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
```

(Continued on next page)

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Platform Notes (Continued)

```
    --runmode rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.019/templogs/preenv.fprate.019.0.log --lognum 019.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /cpu2017


    ----------------------------------------------------------
6. /proc/cpuinfo
    model name        : AMD EPYC 9554 64-Core Processor
    vendor_id         : AuthenticAMD
    cpu family        : 25
    model             : 17
    stepping          : 1
    microcode         : 0xa101148
    bugs              : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size          : 3584 4K pages
    cpu cores         : 64
    siblings          : 128
    2 physical ids (chips)
    256 processors (hardware threads)
    physical id 0: core ids 0-63
    physical id 1: core ids 0-63
    physical id 0: apicids 0-127
    physical id 1: apicids 128-255
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


    ----------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.37.4:
  Architecture:             x86_64
  CPU op-mode(s):           32-bit, 64-bit
  Address sizes:            52 bits physical, 57 bits virtual
  Byte Order:               Little Endian
  CPU(s):                   256
  On-line CPU(s) list:      0-255
  Vendor ID:                AuthenticAMD
  BIOS Vendor ID:           Advanced Micro Devices, Inc.
  Model name:               AMD EPYC 9554 64-Core Processor
  BIOS Model name:          AMD EPYC 9554 64-Core Processor
  CPU family:               25
  Model:                    17
  Thread(s) per core:       2
  Core(s) per socket:       64
  Socket(s):                2
  Stepping:                 1
  Frequency boost:          enabled
  CPU max MHz:              3762.9880
  CPU min MHz:              1500.0000
  BogoMIPS:                 6190.73
  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
```

(Continued on next page)

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Platform Notes (Continued)

```
                   xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                   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:       4 MiB (128 instances)
  L1i cache:       4 MiB (128 instances)
  L2 cache:        128 MiB (128 instances)
  L3 cache:        512 MiB (16 instances)
  NUMA node(s):    8
  NUMA node0 CPU(s):   0-15,128-143
  NUMA node1 CPU(s):   16-31,144-159
  NUMA node2 CPU(s):   32-47,160-175
  NUMA node3 CPU(s):   48-63,176-191
  NUMA node4 CPU(s):   64-79,192-207
  NUMA node5 CPU(s):   80-95,208-223
  NUMA node6 CPU(s):   96-111,224-239
  NUMA node7 CPU(s):   112-127,240-255
  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       4M    8 Data            1    64        1             64
      L1i       32K       4M    8 Instruction     1    64        1             64
      L2         1M     128M    8 Unified         2  2048        1             64
      L3        32M     512M   16 Unified         3 32768        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: 0-15,128-143
    node 0 size: 95903 MB
    node 0 free: 94826 MB
    node 1 cpus: 16-31,144-159
    node 1 size: 96724 MB
    node 1 free: 96081 MB
    node 2 cpus: 32-47,160-175
    node 2 size: 96761 MB
    node 2 free: 96205 MB
    node 3 cpus: 48-63,176-191
    node 3 size: 96761 MB
    node 3 free: 96299 MB
    node 4 cpus: 64-79,192-207
    node 4 size: 96761 MB
    node 4 free: 96152 MB
    node 5 cpus: 80-95,208-223
    node 5 size: 96761 MB
    node 5 free: 96184 MB
```

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Platform Notes (Continued)

```
   node 6 cpus: 96-111,224-239
   node 6 size: 96761 MB
   node 6 free: 96172 MB
   node 7 cpus: 112-127,240-255
   node 7 size: 96698 MB
   node 7 free: 95976 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  12  12  12  32  32  32  32
     1:  12  10  12  12  32  32  32  32
     2:  12  12  10  12  32  32  32  32
     3:  12  12  12  10  32  32  32  32
     4:  32  32  32  32  10  12  12  12
     5:  32  32  32  32  12  10  12  12
     6:  32  32  32  32  12  12  10  12
     7:  32  32  32  32  12  12  12  10

  ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       791687432 kB


  ----------------------------------------------------------
10. who -r
   run-level 3 Sep 27 14:30


  ----------------------------------------------------------
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 mdmonitor microcode nis-domainname openibd
                     rhsmcertd rshim rsyslog selinux-autorelabel-mark sshd sssd systemd-network-generator tuned
                     udisks2
   enabled-runtime   systemd-remount-fs
   disabled          chrony-wait console-getty cpupower debug-shell hwloc-dump-hwdata ibacm kvm_stat
                     man-db-restart-cache-update nftables numad opensmd opensmd@ rdisc rhsm rhsm-facts
                     rpmdb-rebuild serial-getty@ srp_daemon srp_daemon_port@ sshd-keygen@
                     systemd-boot-check-no-failures systemd-pstore systemd-sysext
   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=UUID=45d8a47f-aa7b-4ae3-96b5-c1722597149b
   ro
   crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
   resume=UUID=313c0ec4-25e8-4bf9-8ab5-9f836c1c8dea
   nohz_full=1-255


  ----------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 1.50 GHz and 3.10 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
     boost state support:
```

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Platform Notes (Continued)

```
        Supported: yes
        Active: yes
        Boost States: 0
        Total States: 3
        Pstate-P0:  3100MHz


      ----------------------------------------------------------------
      15. tuned-adm active
        Current active profile: throughput-performance


      ----------------------------------------------------------------
      16. sysctl
        kernel.numa_balancing            1
        kernel.randomize_va_space        0
        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                   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


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


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


      ----------------------------------------------------------------
      20. Disk information
      SPEC is set to: /cpu2017
        Filesystem     Type  Size  Used Avail Use% Mounted on
```

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Platform Notes (Continued)

```
   /dev/sda5      xfs  170G  9.6G  161G   6% /


   ----------------------------------------------------------
 21. /sys/devices/virtual/dmi/id
     Vendor:        XFUSION
     Product:       1258H V7
     Product Family: Genoa


   ----------------------------------------------------------
 22. 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:
     15x Samsung M321R4GA3BB6-CQKDG 32 GB 2 rank 4800
     8x Samsung M321R4GA3BB6-CQKMG 32 GB 2 rank 4800
     1x Samsung M321R4GA3BB6-CQKVG 32 GB 2 rank 4800



   ----------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:    XFUSION
     BIOS Version:   2.09.26
     BIOS Date:      08/15/2024
     BIOS Revision:  2.9
```

Compiler Version Notes

```
==============================================================================================
C              | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
----------------------------------------------------------------------------------------------
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, peak) 510.parest_r(base, peak)
----------------------------------------------------------------------------------------------
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, peak) 526.blender_r(base, peak)
----------------------------------------------------------------------------------------------
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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xFusion

FusionServer 1258H V7
(AMD EPYC 9554)

SPECrate®2017_fp_base = 1240

SPECrate®2017_fp_peak = 1330

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Sep-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Compiler Version Notes (Continued)

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

==================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
--------------------------------------------------------------------------------------
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
--------------------------------------------------------------------------------------

==================================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
--------------------------------------------------------------------------------------
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, peak) 527.cam4_r(base, peak)
--------------------------------------------------------------------------------------
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
```

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xFusion

FusionServer 1258H V7
(AMD EPYC 9554)

SPECrate®2017_fp_base = 1240

SPECrate®2017_fp_peak = 1330

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Sep-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Base Compiler Invocation (Continued)

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`
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
```

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xFusion

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(AMD EPYC 9554)

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CPU2017 License: 6488
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Tested by: xFusion

Test Date: Sep-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Base Optimization Flags (Continued)

C++ benchmarks (continued):
```
-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
-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
```

SPEC CPU®2017 Floating Point Rate Result

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xFusion

FusionServer 1258H V7
(AMD EPYC 9554)

SPECrate®2017_fp_base = 1240

SPECrate®2017_fp_peak = 1330

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Sep-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

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
```

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

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

Peak 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
```

Peak Portability Flags

```
Same as Base Portability Flags
```

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FusionServer 1258H V7
(AMD EPYC 9554)

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CPU2017 License: 6488
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Test Date: Sep-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Peak Optimization Flags

C benchmarks:

519.lbm_r: `basepeak = yes`

538.imagick_r: `basepeak = yes`

544.nab_r: `-m64 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand`
`-fenable-aggressive-gather -Ofast -march=znver4`
`-fveclib=AMDLIBM -ffast-math -fstruct-layout=7`
`-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `-m64 -flto -Wl,-mllvm -Wl,-suppress-fmas`
`-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc`

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -Kieee`
`-Mrecursive -mllvm -reduce-array-computations=3`
`-fepilog-vectorization-of-inductions -fvector-transform`
`-fscalar-transform -lamdlibm -lamdalloc -lflang`

554.roms_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive`
`-mllvm -reduce-array-computations=3`
`-fepilog-vectorization-of-inductions -zopt -lamdlibm`
`-lamdalloc -lflang`

SPEC CPU®2017 Floating Point Rate Result

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(AMD EPYC 9554)

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SPECrate®2017_fp_peak = 1330

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Tested by: xFusion

Test Date: Sep-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

```
521.wrf_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

```
527.cam4_r: basepeak = yes
```

Benchmarks using both C and C++:

```
511.povray_r: -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 -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc
```

```
526.blender_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt
-finline-aggressive -mllvm -unroll-threshold=100 -lamdlibm
-lamdalloc
```

Benchmarks using Fortran, C, and C++:

```
507.cactuBSSN_r: basepeak = yes
```

SPEC CPU®2017 Floating Point Rate Result

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Test Date: Sep-2024
Hardware Availability: Nov-2023
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Peak 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`

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/xFusion-Platform-Settings-AMD-V1.1.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/xFusion-Platform-Settings-AMD-V1.1.xml`

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

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