SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY RX1440 M2,
AMD EPYC 9224, 2.50 GHz

$SPECrate^{®}2017\_int\_base =$ 256

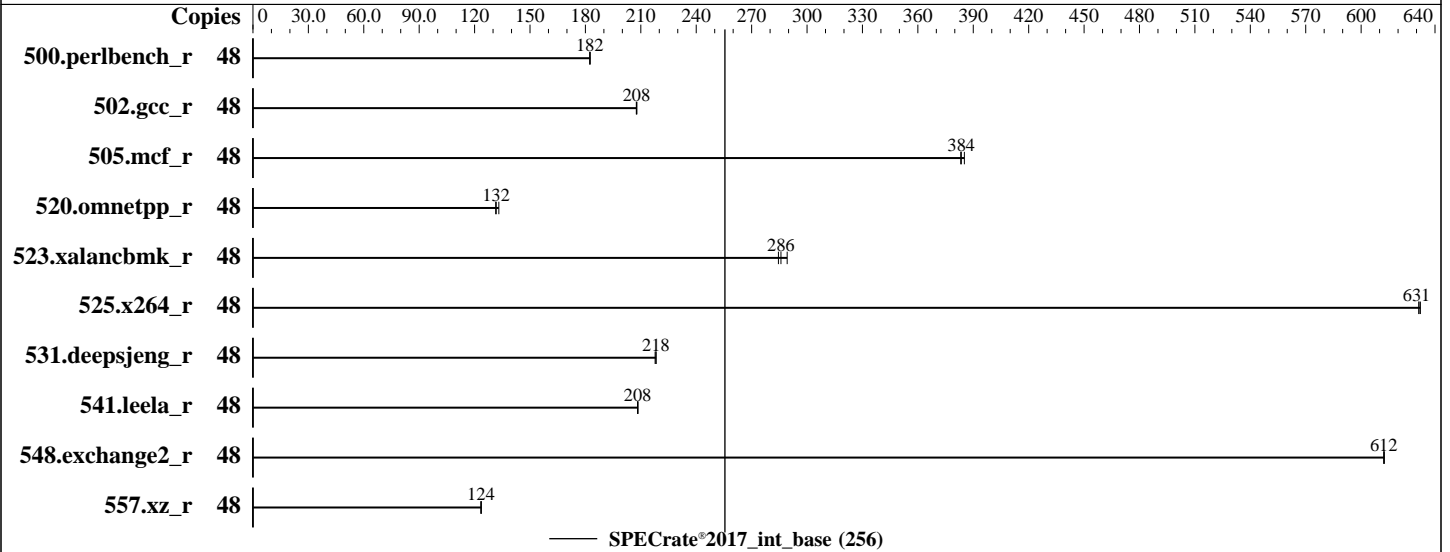$SPECrate^{®}2017\_int\_peak =$ Not Run

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

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

Copies		
500.perlbench_r	48	182
502.gcc_r	48	208
505.mcf_r	48	384
520.omnetpp_r	48	132
523.xalancbmk_r	48	286
525.x264_r	48	631
531.deepsjeng_r	48	218
541.leela_r	48	208
548.exchange2_r	48	612
557.xz_r	48	124

SPECrate®2017_int_base (256)

Hardware

CPU Name: AMD EPYC 9224
  Max MHz: 3700
  Nominal: 2500
Enabled: 24 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 / 6 cores
  Other: None
Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x SATA SSD, 960 GB
Other: Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP4
    5.14.21-150400.22-default
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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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	48	419	182	**419**	**182**	419	183							
502.gcc_r	48	**327**	**208**	327	208	327	208							
505.mcf_r	48	**202**	**384**	201	385	202	383							
520.omnetpp_r	48	479	131	473	133	**478**	**132**							
523.xalancbmk_r	48	**177**	**286**	175	289	178	285							
525.x264_r	48	**133**	**631**	133	632	133	631							
531.deepsjeng_r	48	**252**	**218**	253	218	252	218							
541.leela_r	48	381	208	382	208	**382**	**208**							
548.exchange2_r	48	205	613	**205**	**612**	205	612							
557.xz_r	48	420	123	419	124	**420**	**124**							
SPECrate®2017_int_base =	**256**													
SPECrate®2017_int_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) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
```

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

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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
DF PState Frequency Optimizer = Enabled
Power Profile Selection = High Performance
NUMA nodes per socket = NPS4
Chipselect Interleaving = Enabled
Probe Filter Organization = Shared
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 Thu Feb 29 22:55:02 2024

 SUT (System Under Test) info as seen by some common utilities.

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
```

(Continued on next page)

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Platform Notes (Continued)

```
 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 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
   x86_64 x86_64 x86_64 GNU/Linux

 ------------------------------------------------------------
 2. w
    22:55:02 up 10 min,  1 user,  load average: 0.14, 0.06, 0.05
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                22:53   14.00s  1.18s  0.11s /bin/bash ./amd_rate_aocc400_znver4_A1.sh

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

 ------------------------------------------------------------
 4. ulimit -a
   core file size          (blocks, -c) unlimited
   data seg size           (kbytes, -d) unlimited
   scheduling priority             (-e) 0
   file size               (blocks, -f) unlimited
   pending signals                 (-i) 1544403
   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) 1544403
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited

 ------------------------------------------------------------
 5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 30
  login -- root
  -bash
  -bash
  python3 ./run_amd_intrate_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 intrate
  runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 --nopower
    --runmode rate --tune base --size test:train:refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
  $SPEC = /home/Benchmark/speccpu2017r
```

(Continued on next page)

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SPECrate®2017_int_peak = Not Run

CPU2017 License: 19
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Test Date: Feb-2024
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Software Availability: Nov-2022

Platform Notes (Continued)

```
    ----------------------------------------------------------
 6. /proc/cpuinfo
    model name        : AMD EPYC 9224 24-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         : 24
    siblings          : 48
    1 physical ids (chips)
    48 processors (hardware threads)
    physical id 0: core ids 0-5,8-13,16-21,24-29
    physical id 0: apicids 0-11,16-27,32-43,48-59
  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 2.37.2:
  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):                 48
  On-line CPU(s) list:    0-47
  Vendor ID:              AuthenticAMD
  Model name:             AMD EPYC 9224 24-Core Processor
  CPU family:             25
  Model:                  17
  Thread(s) per core:     2
  Core(s) per socket:     24
  Socket(s):              1
  Stepping:               1
  Frequency boost:        enabled
  CPU max MHz:            3706.0540
  CPU min MHz:            1500.0000
  BogoMIPS:               4992.40
  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
                          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:              768 KiB (24 instances)
  L1i cache:              768 KiB (24 instances)
```

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Platform Notes (Continued)

```
   L2 cache:                  24 MiB (24 instances)
   L3 cache:                  64 MiB (4 instances)
   NUMA node(s):              4
   NUMA node0 CPU(s):         0-5,24-29
   NUMA node1 CPU(s):         6-11,30-35
   NUMA node2 CPU(s):         12-17,36-41
   NUMA node3 CPU(s):         18-23,42-47
   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 and seccomp
   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     768K  8 Data              1    64        1              64
      L1i       32K     768K  8 Instruction       1    64        1              64
      L2         1M      24M  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: 0-5,24-29
   node 0 size: 96193 MB
   node 0 free: 95484 MB
   node 1 cpus: 6-11,30-35
   node 1 size: 96764 MB
   node 1 free: 96475 MB
   node 2 cpus: 12-17,36-41
   node 2 size: 96730 MB
   node 2 free: 96179 MB
   node 3 cpus: 18-23,42-47
   node 3 size: 96436 MB
   node 3 free: 96090 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:       395392104 kB


  --------------------------------------------------------------
 10. who -r
   run-level 3 Feb 29 22:44


  --------------------------------------------------------------
 11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target  Status
    multi-user      running
```

(Continued on next page)

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Platform Notes (Continued)

```
         ----------------------------------------------------------
         12. Services, from systemctl list-unit-files
           STATE           UNIT FILES
           enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager getty@
                           haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early klog libvirtd
                           lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4
                           wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
           enabled-runtime systemd-remount-fs
           disabled        accounts-daemon appstream-sync-cache autofs autoyast-initscripts blk-availability
                           bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups
                           cups-browsed debug-shell dnsmasq ebtables exchange-bmc-os-info firewalld gpm grub2-once
                           haveged-switch-root hwloc-dump-hwdata ipmi ipmievd iscsi-init iscsid iscsiuio
                           issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask man-db-create multipathd
                           nfs nfs-blkmap nfs-server nfsserver nmb ostree-remount rdisc rpcbind rpmconfigcheck rsyncd
                           rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd
                           strongswan strongswan-starter svnserve systemd-boot-check-no-failures
                           systemd-network-generator systemd-nspawn@ systemd-sysext systemd-time-wait-sync
                           systemd-timesyncd tcsd udisks2 upower virtinterfaced virtnetworkd virtnodedevd
                           virtnwfilterd virtproxyd virtqemud virtsecretd virtstoraged
           indirect        pcscd virtlockd virtlogd wickedd

         ----------------------------------------------------------
         13. Linux kernel boot-time arguments, from /proc/cmdline
           BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
           root=UUID=46eaef58-8574-42bf-834a-7fe69b4893c9
           splash=silent
           mitigations=auto
           quiet
           security=apparmor
           crashkernel=272M,high
           crashkernel=72M,low

         ----------------------------------------------------------
         14. cpupower frequency-info
           analyzing CPU 0:
             current policy: frequency should be within 1.50 GHz and 2.50 GHz.
                             The governor "ondemand" 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          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
```

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Platform Notes (Continued)

```
  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 SUSE Linux Enterprise Server 15 SP4


  ----------------------------------------------------------
19. Disk information
SPEC is set to: /home/Benchmark/speccpu2017r
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda3      xfs   645G   48G  598G   8% /home


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


  ----------------------------------------------------------
21. dmidecode
  Additional information from dmidecode 3.2 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


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

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Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_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++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_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 | 548.exchange2_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
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Base Portability Flags

500.perlbench_r: `-DSPEC_LINUX_X64 -DSPEC_LP64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LINUX -DSPEC_LP64`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`

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

Fujitsu

PRIMERGY RX1440 M2,
AMD EPYC 9224, 2.50 GHz

SPECrate®2017_int_base = 256

SPECrate®2017_int_peak = Not Run

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

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

Base Portability Flags (Continued)

548.exchange2_r: `-DSPEC_LP64`
557.xz_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
-z muldefs -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 -lflang
-lamdalloc
```

C++ benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

Base Other Flags

C benchmarks:

```
-Wno-unused-command-line-argument
```

C++ benchmarks:

```
-Wno-unused-command-line-argument
```

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Fujitsu

PRIMERGY RX1440 M2,
AMD EPYC 9224, 2.50 GHz

SPECrate®2017_int_base =   256

SPECrate®2017_int_peak = Not Run

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

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

Base Other Flags (Continued)

Fortran benchmarks:
```
-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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