



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

New H3C Technologies Co., Ltd.

SPECrate®2017\_int\_base = 584

H3C UniServer R4950 G6 (AMD EPYC 9254)

SPECrate®2017\_int\_peak = 597

CPU2017 License: 9066

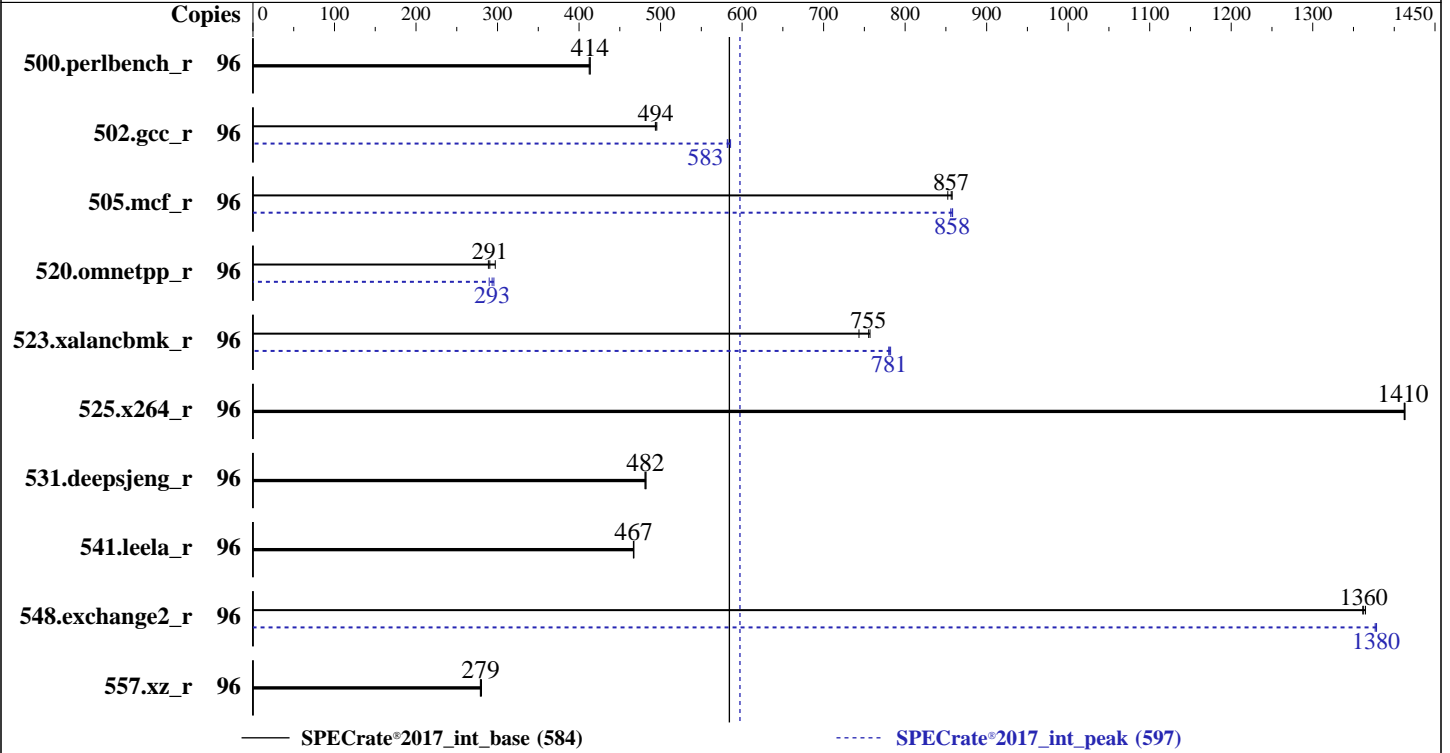
Test Date: Oct-2024

Test Sponsor: New H3C Technologies Co., Ltd.

Hardware Availability: Feb-2024

Tested by: New H3C Technologies Co., Ltd.

Software Availability: Nov-2023



### Hardware

CPU Name: AMD EPYC 9254  
 Max MHz: 4150  
 Nominal: 2900  
 Enabled: 48 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: 128 MB I+D on chip per chip, 32 MB shared / 6 cores  
 Other: None  
 Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-5600B-R, running at 4800)  
 Storage: 1 x 256GB NVME  
 Other: CPU Cooling: Air

### Software

OS: Red Hat Enterprise Linux release 9.3 (Plow)  
 kernel version 5.14.0-362.8.1.el9\_3.x86\_64  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: No  
 Firmware: Version 6.30.28 released Feb-2024  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: None  
 Power Management: BIOS and OS 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	96	371	412	369	414	<b>370</b>	<b>414</b>	96	371	412	369	414	<b>370</b>	<b>414</b>
502.gcc_r	96	275	494	274	495	<b>275</b>	<b>494</b>	96	232	586	<b>233</b>	<b>583</b>	234	582
505.mcf_r	96	181	858	<b>181</b>	<b>857</b>	182	852	96	<b>181</b>	<b>858</b>	181	858	181	856
520.omnetpp_r	96	436	289	<b>434</b>	<b>291</b>	424	297	96	<b>429</b>	<b>293</b>	426	296	435	290
523.xalancbmk_r	96	134	757	<b>134</b>	<b>755</b>	136	743	96	130	780	130	782	<b>130</b>	<b>781</b>
525.x264_r	96	<b>119</b>	<b>1410</b>	119	1410	119	1410	96	<b>119</b>	<b>1410</b>	119	1410	119	1410
531.deepsjeng_r	96	228	482	229	481	<b>228</b>	<b>482</b>	96	228	482	229	481	<b>228</b>	<b>482</b>
541.leela_r	96	341	467	<b>340</b>	<b>467</b>	340	467	96	341	467	<b>340</b>	<b>467</b>	340	467
548.exchange2_r	96	184	1360	185	1360	<b>185</b>	<b>1360</b>	96	182	1380	183	1380	<b>183</b>	<b>1380</b>
557.xz_r	96	370	280	<b>371</b>	<b>279</b>	372	279	96	370	280	<b>371</b>	<b>279</b>	372	279

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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,  
'echo always > /sys/kernel/mm/transparent\_hugepage/enabled' and  
'echo always > /sys/kernel/mm/transparent\_hugepage/defrag' run as root.



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## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =
    "/home/cpull19/amd_rate_aocc400_znver4_A_lib/lib:/home/cpull19/amd_rate_aocc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

Environment variables set by runcpu during the 523.xalancbmk\_r peak run:

```
MALLOC_CONF = "thp:never"
```

## 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:

```
cTDP Control: Manual
cTDP: 240
PPT Control: Manual
PPT: 240
Determinism Slider set to Power
NUMA nodes per socket: NPS4
IOMMU: Auto
SVM Mode: Disabled
ACPI SRAT L3 Cache As NUMA Domain: Enabled
```

```
Sysinfo program /home/cpull19/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Sat Oct 19 08:24:49 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 252 (252-18.e19)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active

(Continued on next page)



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## Platform Notes (Continued)

- 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 5.14.0-362.8.1.el9_3.x86_64 #1 SMP PREEMPT_DYNAMIC Tue Oct 3 11:12:36 EDT 2023
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
08:24:49 up 3 min, 1 user, load average: 0.76, 1.14, 0.53
USER      TTY      LOGIN@  IDLE   JCPU   PCPU WHAT
root      tty1     21Aug23 17.00s  1.34s  0.13s /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) 6189007
max locked memory (kbytes, -l) 2097152
max memory size (kbytes, -m) unlimited
open files (-n) 32768
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) unlimited
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited
```

```
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 31
login -- root
-bash
-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 intrate
runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.005/templogs/preenv.intrate.005.0.log --lognum 005.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpull9
```

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## Platform Notes (Continued)

### 6. /proc/cpuinfo

```

model name      : AMD EPYC 9254 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
2 physical ids (chips)
96 processors (hardware threads)
physical id 0: core ids 0-5,8-13,16-21,24-29
physical id 1: core ids 0-5,8-13,16-21,24-29
physical id 0: apicids 0-11,16-27,32-43,48-59
physical id 1: apicids 64-75,80-91,96-107,112-123

```

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):                 96
On-line CPU(s) list:   0-95
Vendor ID:              AuthenticAMD
BIOS Vendor ID:        Advanced Micro Devices, Inc.
Model name:             AMD EPYC 9254 24-Core Processor
BIOS Model name:       AMD EPYC 9254 24-Core Processor
CPU family:             25
Model:                  17
Thread(s) per core:    2
Core(s) per socket:    24
Socket(s):              2
Stepping:               1
Frequency boost:       enabled
CPU max MHz:            4151.7568
CPU min MHz:            1500.0000
BogoMIPS:               5786.28
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 amd_lbr_v2 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 perfmon_v2 ibrs ibpb
                        stibp ibrs_enhanced 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 cppc arat npt lbrv svm_lock
                        nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
                        pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi

```

(Continued on next page)



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## Platform Notes (Continued)

avx512vbmi umip pku ospke avx512\_vbmi2 gfni vaes vpclmulqdq avx512\_vnni  
avx512\_bitalg avx512\_vpopcntdq la57 rdpid overflow\_recov succor smca  
fsrm flush\_llid

```

Virtualization: AMD-V
L1d cache: 1.5 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 48 MiB (48 instances)
L3 cache: 256 MiB (8 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-5,48-53
NUMA node1 CPU(s): 6-11,54-59
NUMA node2 CPU(s): 12-17,60-65
NUMA node3 CPU(s): 18-23,66-71
NUMA node4 CPU(s): 24-29,72-77
NUMA node5 CPU(s): 30-35,78-83
NUMA node6 CPU(s): 36-41,84-89
NUMA node7 CPU(s): 42-47,90-95
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; userscopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS, IBPB conditional, STIBP
always-on, RSB filling, PBRSE-eIBRS Not affected
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	1.5M	8	Data	1	64	1	64
L1i	32K	1.5M	8	Instruction	1	64	1	64
L2	1M	48M	8	Unified	2	2048	1	64
L3	32M	256M	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: 0-5,48-53
node 0 size: 192663 MB
node 0 free: 191731 MB
node 1 cpus: 6-11,54-59
node 1 size: 193532 MB
node 1 free: 192851 MB
node 2 cpus: 12-17,60-65
node 2 size: 193532 MB
node 2 free: 192643 MB
node 3 cpus: 18-23,66-71
node 3 size: 193532 MB
node 3 free: 193022 MB
node 4 cpus: 24-29,72-77
node 4 size: 193479 MB
node 4 free: 192562 MB
node 5 cpus: 30-35,78-83
node 5 size: 193532 MB
node 5 free: 192899 MB

```

(Continued on next page)



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## Platform Notes (Continued)

```

node 6 cpus: 36-41,84-89
node 6 size: 193532 MB
node 6 free: 192941 MB
node 7 cpus: 42-47,90-95
node 7 size: 193488 MB
node 7 free: 192998 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10 12 12 12 22 22 22 22
1:  12 10 12 12 22 22 22 22
2:  12 12 10 12 22 22 22 22
3:  12 12 12 10 22 22 22 22
4:  22 22 22 22 10 12 12 12
5:  22 22 22 22 12 10 12 12
6:  22 22 22 22 12 12 10 12
7:  22 22 22 22 12 12 12 10

```

```

-----
9. /proc/meminfo
   MemTotal:      1584429632 kB

```

```

-----
10. who -r
    run-level 3 Aug 21 20:00

```

```

-----
11. Systemd service manager version: systemd 252 (252-18.e19)
    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 getty@ insights-client-boot irqbalance kdump lvm2-monitor mdmonitor microcode
nis-domainname nvme-fc-boot-connections rhsmcertd rsyslog selinux-autorelabel-mark sshd
sssd systemd-boot-update systemd-network-generator tuned udisks2
enabled-runtime systemd-remount-fs
disabled blk-availability chronty-wait console-getty cpupower debug-shell dnf-system-upgrade
firewalld hwloc-dump-hwdata kvm_stat man-db-restart-cache-update nftables nvmmf-autoconnect
rdisc rhcd rhsm rhsm-facts rpmdb-rebuild selinux-check-proper-disable serial-getty@
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 systemd-sysupdate
systemd-sysupdate-reboot

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-362.8.1.el9_3.x86_64
root=/dev/mapper/rhel-root
ro
crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap

```

```

-----
14. cpupower frequency-info
    analyzing CPU 0:
        current policy: frequency should be within 1.50 GHz and 2.90 GHz.
                        The governor "performance" may decide which speed to use

```

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## Platform Notes (Continued)

within this range.

boost state support:

Supported: yes  
Active: yes  
Boost States: 0  
Total States: 3  
Pstate-P0: 2900MHz

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

-----  
16. sysctl  
kernel.numa\_balancing 0  
kernel.randomize\_va\_space 0  
vm.compaction\_proactiveness 20  
vm.dirty\_background\_bytes 0  
vm.dirty\_background\_ratio 40  
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 50000  
-----

-----  
19. OS release  
From /etc/\*-release /etc/\*-version  
os-release Red Hat Enterprise Linux 9.3 (Plow)  
redhat-release Red Hat Enterprise Linux release 9.3 (Plow)  
system-release Red Hat Enterprise Linux release 9.3 (Plow)  
-----

-----  
20. Disk information  
-----

(Continued on next page)





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## Platform Notes (Continued)

SPEC is set to: /home/cpu119

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel-home	xfs	163G	5.4G	158G	4%	/home

```

21. /sys/devices/virtual/dmi/id
Vendor:      H3C
Product:     RS33M2C9S
Product Family: Rack
Serial:      N/A

```

```

22. dmidecode
Additional information from dmidecode 3.5 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:
  24x Samsung M321R8GA0PB0-CWMJJ 64 GB 2 rank 5600, configured at 4800

```

```

23. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:      American Megatrends International, LLC.
BIOS Version:     6.30.28
BIOS Date:        02/27/2024
BIOS Revision:    5.27

```

## Compiler Version Notes

```

=====
C      | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
=====

```

```

=====
C      | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
      | 557.xz_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      | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
=====

```

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# SPEC CPU®2017 Integer Rate Result

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New H3C Technologies Co., Ltd.

SPECrate®2017\_int\_base = 584

H3C UniServer R4950 G6 (AMD EPYC 9254)

SPECrate®2017\_int\_peak = 597

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Oct-2024

Hardware Availability: Feb-2024

Software Availability: Nov-2023

## Compiler Version Notes (Continued)

C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 505.mcf\_r(base, peak) 525.x264\_r(base, peak)  
557.xz\_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++ | 523.xalancbmk\_r(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: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

C++ | 520.omnetpp\_r(base, peak) 523.xalancbmk\_r(base) 531.deepsjeng\_r(base, peak) 541.leela\_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++ | 523.xalancbmk\_r(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: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

C++ | 520.omnetpp\_r(base, peak) 523.xalancbmk\_r(base) 531.deepsjeng\_r(base, peak) 541.leela\_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 | 548.exchange2\_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



# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 584

H3C UniServer R4950 G6 (AMD EPYC 9254)

SPECrate®2017\_int\_peak = 597

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Oct-2024

Hardware Availability: Feb-2024

Software Availability: Nov-2023

## 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
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
-lamdallic
```

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
```

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# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 584

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SPECrate®2017\_int\_peak = 597

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Oct-2024

Hardware Availability: Feb-2024

Software Availability: Nov-2023

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

-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

Fortran benchmarks:

-Wno-unused-command-line-argument

## Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

## Peak Portability Flags

500.perlbench\_r: -DSPEC\_LINUX\_X64 -DSPEC\_LP64

502.gcc\_r: -D\_FILE\_OFFSET\_BITS=64

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# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 584

H3C UniServer R4950 G6 (AMD EPYC 9254)

SPECrate®2017\_int\_peak = 597

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Oct-2024

Hardware Availability: Feb-2024

Software Availability: Nov-2023

## Peak Portability Flags (Continued)

```

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
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

```

## Peak Optimization Flags

C benchmarks:

500.perlbench\_r: basepeak = yes

```

502.gcc_r: -m32 -flto -z muldefs -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 -fgnu89-inline
-lamdalloc

```

```

505.mcf_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -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
-lflang -lamdalloc

```

525.x264\_r: basepeak = yes

557.xz\_r: basepeak = yes

C++ benchmarks:

```

520.omnetpp_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lamdalloc-ext

```

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# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 584

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SPECrate®2017\_int\_peak = 597

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Oct-2024

Hardware Availability: Feb-2024

Software Availability: Nov-2023

## Peak Optimization Flags (Continued)

```
523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
-ffast-math -finline-aggressive
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamalloc-ext
```

531.deepsjeng\_r: basepeak = yes

541.leela\_r: basepeak = yes

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 -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 -lamalloc
```

## Peak Other Flags

C benchmarks (except as noted below):

-Wno-unused-command-line-argument

502.gcc\_r: -L/usr/lib32 -Wno-unused-command-line-argument

-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd\_rate\_aocc400\_znver4\_A\_lib/lib32

C++ benchmarks (except as noted below):

-Wno-unused-command-line-argument

523.xalancbmk\_r: -L/usr/lib32 -Wno-unused-command-line-argument

-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd\_rate\_aocc400\_znver4\_A\_lib/lib32

Fortran benchmarks:

-Wno-unused-command-line-argument



# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 584

H3C UniServer R4950 G6 (AMD EPYC 9254)

SPECrate®2017\_int\_peak = 597

**CPU2017 License:** 9066

**Test Sponsor:** New H3C Technologies Co., Ltd.

**Tested by:** New H3C Technologies Co., Ltd.

**Test Date:** Oct-2024

**Hardware Availability:** Feb-2024

**Software Availability:** Nov-2023

The flags files that were used to format this result can be browsed at

[http://www.spec.org/cpu2017/flags/New\\_H3C-Platform-AMD-Settings-V1.4-Genoa.html](http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.4-Genoa.html)

<http://www.spec.org/cpu2017/flags/aocc400-flags.html>

You can also download the XML flags sources by saving the following links:

[http://www.spec.org/cpu2017/flags/New\\_H3C-Platform-AMD-Settings-V1.4-Genoa.xml](http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.4-Genoa.xml)

<http://www.spec.org/cpu2017/flags/aocc400-flags.xml>

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