



# SPEC CPU®2017 Integer Rate Result

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## xFusion

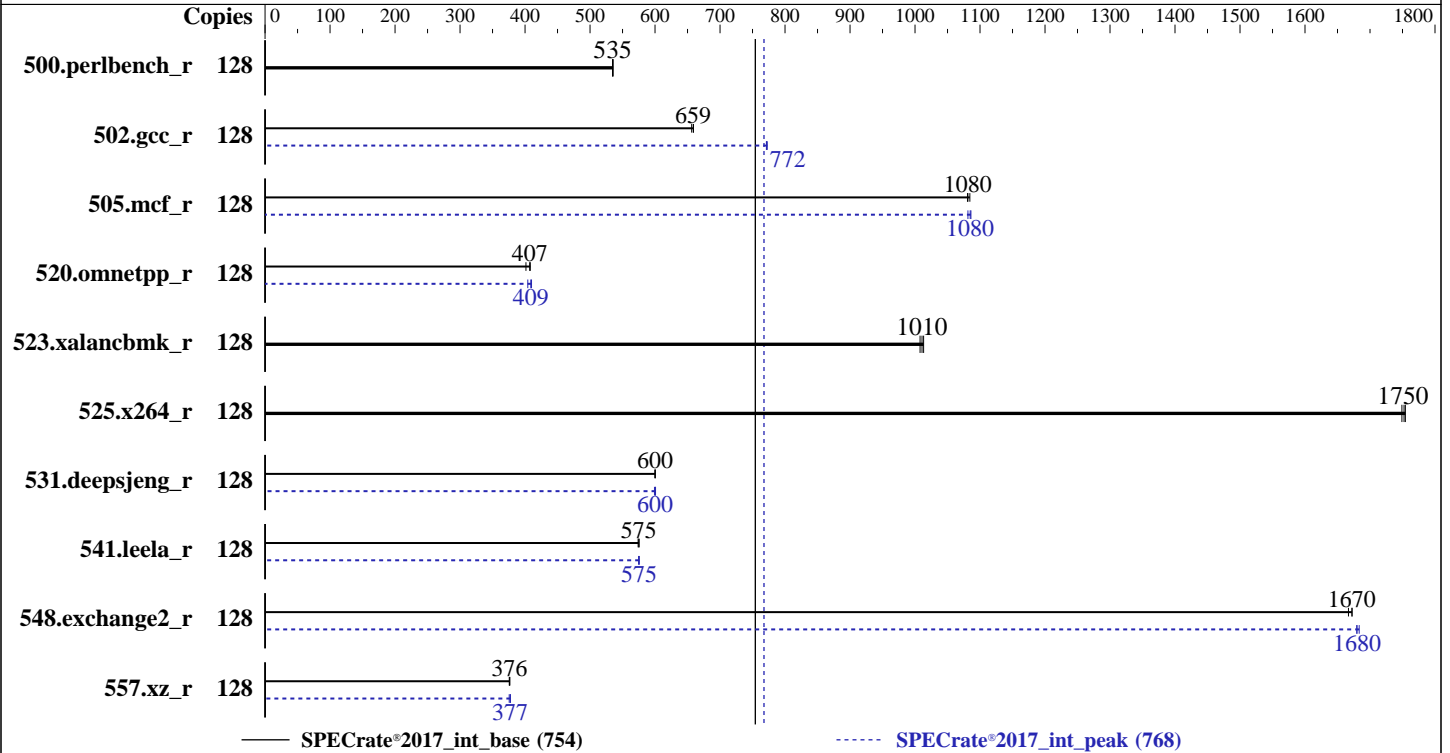
FusionServer 2258H V7  
(AMD EPYC 9354)

SPECrate®2017\_int\_base = 754

SPECrate®2017\_int\_peak = 768

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

Test Date: Sep-2024  
Hardware Availability: Jun-2024  
Software Availability: Dec-2022



### Hardware

CPU Name: AMD EPYC 9354  
Max MHz: 3800  
Nominal: 3250  
Enabled: 64 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 / 4 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 5 (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	128	381	535	<b><u>381</u></b>	<b><u>535</u></b>	381	536	128	381	535	<b><u>381</u></b>	<b><u>535</u></b>	381	536
502.gcc_r	128	276	656	275	659	<b><u>275</u></b>	<b><u>659</u></b>	128	<b><u>235</u></b>	<b><u>772</u></b>	235	773	235	771
505.mcf_r	128	191	1080	<b><u>191</u></b>	<b><u>1080</u></b>	191	1080	128	<b><u>191</u></b>	<b><u>1080</u></b>	191	1080	190	1090
520.omnetpp_r	128	412	408	<b><u>412</u></b>	<b><u>407</u></b>	418	401	128	<b><u>411</u></b>	<b><u>409</u></b>	410	410	415	404
523.xalancbmk_r	128	133	1010	<b><u>134</u></b>	<b><u>1010</u></b>	134	1010	128	133	1010	<b><u>134</u></b>	<b><u>1010</u></b>	134	1010
525.x264_r	128	128	1750	<b><u>128</u></b>	<b><u>1750</u></b>	128	1750	128	128	1750	<b><u>128</u></b>	<b><u>1750</u></b>	128	1750
531.deepsjeng_r	128	<b><u>244</u></b>	<b><u>600</u></b>	244	600	244	600	128	245	599	<b><u>244</u></b>	<b><u>600</u></b>	244	601
541.leela_r	128	369	574	<b><u>369</u></b>	<b><u>575</u></b>	368	575	128	368	576	369	575	<b><u>368</u></b>	<b><u>575</u></b>
548.exchange2_r	128	201	1670	201	1670	<b><u>201</u></b>	<b><u>1670</u></b>	128	200	1680	<b><u>200</u></b>	<b><u>1680</u></b>	199	1680
557.xz_r	128	368	376	367	377	<b><u>368</u></b>	<b><u>376</u></b>	128	368	376	366	377	<b><u>366</u></b>	<b><u>377</u></b>

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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 = "/cpu2017/amd\_rate\_aocc400\_znver4\_A\_lib/lib:/cpu2017/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 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 Tue Sep 24 17:09:28 2024

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

-----  
Table of contents  
-----

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 250 (250-6.el9\_0)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. 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

(Continued on next page)



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### Platform Notes (Continued)

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  
17:09:28 up 2 min, 2 users, load average: 0.69, 0.92, 0.42  
USER TTY LOGIN@ IDLE JCPU PCPU WHAT  
root pts/0 17:07 40.00s 0.02s 0.02s -bash  
root pts/1 17:08 8.00s 1.03s 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 rhgb --switched-root --system --deserialize 31  
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups  
sshd: root [priv]  
sshd: root@pts/1  
-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/CPU2017.035/templogs/preenv.intrate.035.0.log --lognum 035.0 --from\_runcpu 2  
specperl \$SPEC/bin/sysinfo  
\$SPEC = /cpu2017

-----  
6. /proc/cpuinfo  
model name : AMD EPYC 9354 32-Core Processor

(Continued on next page)



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### Platform Notes (Continued)

```

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     : 32
siblings      : 64
2 physical ids (chips)
128 processors (hardware threads)
physical id 0: core ids 0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59
physical id 1: core ids 0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59
physical id 0: apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
physical id 1: apicids 128-135,144-151,160-167,176-183,192-199,208-215,224-231,240-247

```

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):                128
On-line CPU(s) list:  0-127
Vendor ID:             AuthenticAMD
BIOS Vendor ID:       Advanced Micro Devices, Inc.
Model name:            AMD EPYC 9354 32-Core Processor
BIOS Model name:      AMD EPYC 9354 32-Core Processor
CPU family:            25
Model:                17
Thread(s) per core:   2
Core(s) per socket:   32
Socket(s):             2
Stepping:              1
Frequency boost:      enabled
CPU max MHz:           3799.0720
CPU min MHz:           1500.0000
BogoMIPS:              6489.80
Flags:                 fpvme 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 pdpelgb rdtscp lm
                      constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rapl
                      pni pclmulqdq monitor ssse3 fma cxl6 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:             2 MiB (64 instances)

```

(Continued on next page)



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### Platform Notes (Continued)

```

L1i cache:                2 MiB (64 instances)
L2 cache:                 64 MiB (64 instances)
L3 cache:                 512 MiB (16 instances)
NUMA node(s):             8
NUMA node0 CPU(s):       0-7,64-71
NUMA node1 CPU(s):       8-15,72-79
NUMA node2 CPU(s):       16-23,80-87
NUMA node3 CPU(s):       24-31,88-95
NUMA node4 CPU(s):       32-39,96-103
NUMA node5 CPU(s):       40-47,104-111
NUMA node6 CPU(s):       48-55,112-119
NUMA node7 CPU(s):       56-63,120-127
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/swaps 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	2M	8	Data	1	64	1	64
L1i	32K	2M	8	Instruction	1	64	1	64
L2	1M	64M	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: 0-7,64-71
node 0 size: 95928 MB
node 0 free: 95399 MB
node 1 cpus: 8-15,72-79
node 1 size: 96764 MB
node 1 free: 95752 MB
node 2 cpus: 16-23,80-87
node 2 size: 96728 MB
node 2 free: 96315 MB
node 3 cpus: 24-31,88-95
node 3 size: 96764 MB
node 3 free: 96350 MB
node 4 cpus: 32-39,96-103
node 4 size: 96764 MB
node 4 free: 96381 MB
node 5 cpus: 40-47,104-111
node 5 size: 96764 MB
node 5 free: 96386 MB
node 6 cpus: 48-55,112-119
node 6 size: 96764 MB
node 6 free: 96392 MB
node 7 cpus: 56-63,120-127
node 7 size: 96711 MB
node 7 free: 96294 MB
node distances:
node  0  1  2  3  4  5  6  7

```

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### Platform Notes (Continued)

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: 791747028 kB

10. who -r  
run-level 5 Sep 24 17:07

11. Systemd service manager version: systemd 250 (250-6.el9\_0)  
Default Target Status  
graphical running

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker firewallld gdm getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname nvme-fc-boot-connections ostree-remount power-profiles-daemon qemu-guest-agent rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark smartd sshd sssd switcheroo-control systemd-network-generator tuned udisks2 upower vgauthd vmtoolsd
enabled-runtime	systemd-remount-fs
disabled	arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed dbus-daemon debug-shell dnsmasq hwloc-dump-hwdata iprdump iprinit iprupdate iscsid iscsiui kpatch kvm_stat ledmon man-db-restart-cache-update nftables nvme-autoconnect podman podman-auto-update podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts rpmdb-rebuild serial-getty@ speech-dispatcherd sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysextr wpa_supplicant
indirect	spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

13. Linux kernel boot-time arguments, from /proc/cmdline  
BOOT\_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9\_0.x86\_64  
root=/dev/mapper/rhel-root  
ro  
crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M  
resume=/dev/mapper/rhel-swap  
rd.lvm.lv=rhel/root  
rd.lvm.lv=rhel/swap  
rhgb  
quiet  
nohz\_full=1-127

14. cpupower frequency-info  
analyzing CPU 0:  
current policy: frequency should be within 1.50 GHz and 3.25 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: 3250MHz

-----  
15. tuned-adm active  
Current active profile: latency-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 3  
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

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### Platform Notes (Continued)

SPEC is set to: /cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel-root	xfs	70G	11G	60G	15%	/

```

-----
21. /sys/devices/virtual/dmi/id
Vendor:          XFUSION
Product:         2258H 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:
  24x Samsung M321R4GA3BB6-CQKDG 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 | 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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## xFusion

FusionServer 2258H V7  
(AMD EPYC 9354)

SPECrate®2017\_int\_base = 754

SPECrate®2017\_int\_peak = 768

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

**Test Date:** Sep-2024  
**Hardware Availability:** Jun-2024  
**Software Availability:** Dec-2022

### 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++ | 520.omnetpp\_r(base, peak) 523.xalancbmk\_r(base, peak) 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  
-----

### 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

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**Test Date:** Sep-2024  
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## Base Portability Flags (Continued)

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
-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
```

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# SPEC CPU®2017 Integer Rate Result

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## xFusion

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SPECrate®2017\_int\_base = 754

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

**Test Date:** Sep-2024  
**Hardware Availability:** Jun-2024  
**Software Availability:** Dec-2022

## Base Other Flags (Continued)

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  
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

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# SPEC CPU®2017 Integer Rate Result

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## xFusion

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**CPU2017 License:** 6488  
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**Tested by:** xFusion

**Test Date:** Sep-2024  
**Hardware Availability:** Jun-2024  
**Software Availability:** Dec-2022

## Peak Optimization Flags (Continued)

502.gcc\_r (continued):

```
-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: Same as 505.mcf\_r

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
```

523.xalancbmk\_r: basepeak = yes

531.deepsjeng\_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

```
-Wl,-mllvm -Wl,-reduce-array-computations=3 -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 -lamdalloc-ext
```

541.leela\_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 -lflang -lamdalloc-ext
```

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**Tested by:** xFusion

**Test Date:** Sep-2024  
**Hardware Availability:** Jun-2024  
**Software Availability:** Dec-2022

## Peak Optimization Flags (Continued)

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 -lamdalloc
```

## 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:

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

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/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>

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