



# SPEC CPU®2017 Integer Rate Result

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## Supermicro

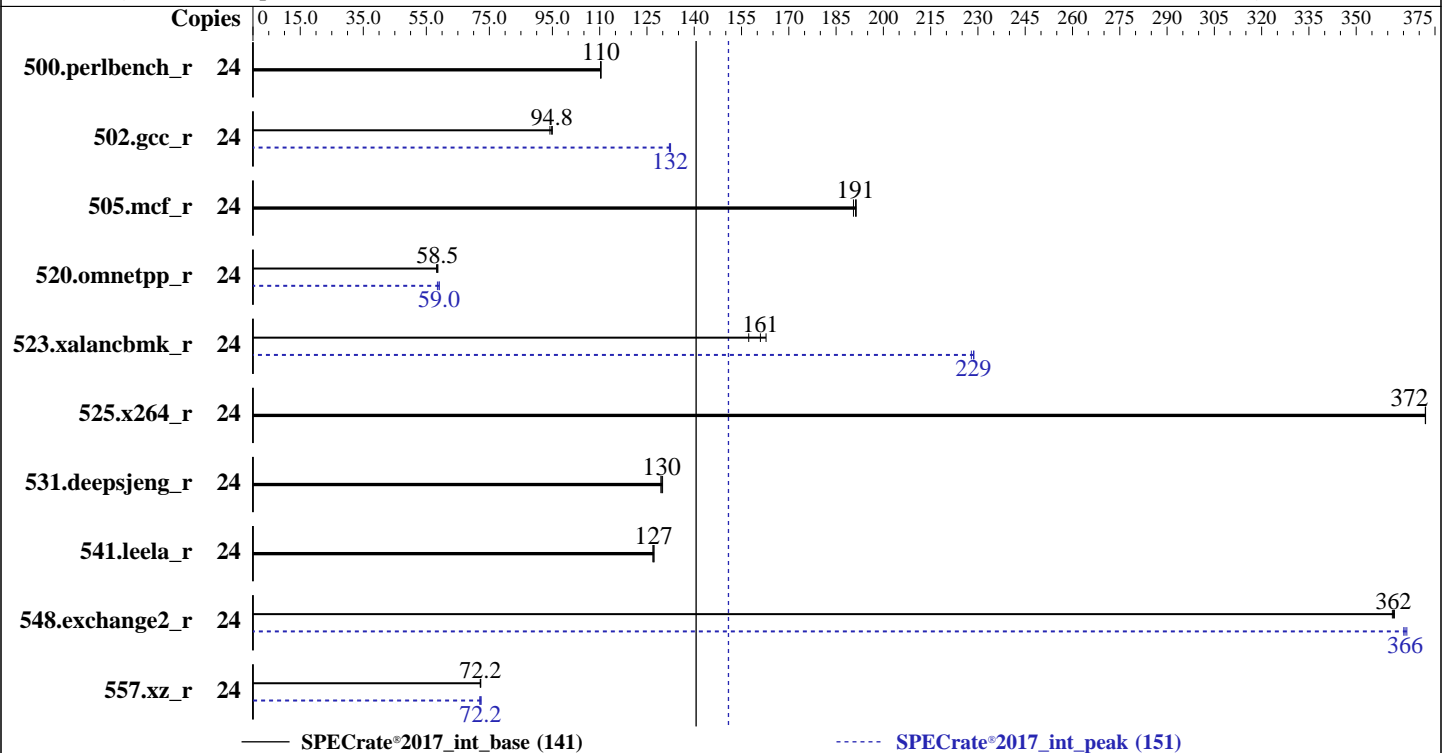
Mainstream A+ Server AS -1015A-MT  
(H13SAE-MF, AMD EPYC 4464P)

SPECrate®2017\_int\_base = 141

SPECrate®2017\_int\_peak = 151

CPU2017 License: 001176  
Test Sponsor: Supermicro  
Tested by: Supermicro

Test Date: Apr-2024  
Hardware Availability: May-2024  
Software Availability: Mar-2024



### Hardware

CPU Name: AMD EPYC 4464P  
Max MHz: 5600  
Nominal: 4700  
Enabled: 12 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, 32 MB shared / 6 cores  
Other: None  
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-5600B-U, running at 5200)  
Storage: 1 x 960 GB NVMe SSD  
Other: CPU Cooling: Air

### Software

OS: Ubuntu 22.04.4 LTS  
Kernel 6.5.0-27-generic  
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
Parallel: No  
Firmware: Version 1.2a released Feb-2024  
File System: ext4  
System State: Run level 5 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other: None  
Power Management: 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	24	346	110	<b>346</b>	<b>110</b>	346	110	24	346	110	<b>346</b>	<b>110</b>	346	110
502.gcc_r	24	<b>359</b>	<b>94.8</b>	361	94.2	358	95.0	24	257	132	256	132	<b>257</b>	<b>132</b>
505.mcf_r	24	203	191	<b>203</b>	<b>191</b>	204	191	24	203	191	<b>203</b>	<b>191</b>	204	191
520.omnetpp_r	24	<b>538</b>	<b>58.5</b>	541	58.3	537	58.7	24	533	59.1	538	58.5	<b>533</b>	<b>59.0</b>
523.xalancbmk_r	24	156	163	<b>157</b>	<b>161</b>	161	157	24	111	229	<b>111</b>	<b>229</b>	111	228
525.x264_r	24	113	372	<b>113</b>	<b>372</b>	113	372	24	113	372	<b>113</b>	<b>372</b>	113	372
531.deepsjeng_r	24	<b>212</b>	<b>130</b>	212	130	213	129	24	<b>212</b>	<b>130</b>	212	130	213	129
541.leela_r	24	<b>313</b>	<b>127</b>	313	127	312	127	24	<b>313</b>	<b>127</b>	313	127	312	127
548.exchange2_r	24	174	361	<b>174</b>	<b>362</b>	174	362	24	<b>172</b>	<b>366</b>	172	365	172	366
557.xz_r	24	<b>359</b>	<b>72.2</b>	359	72.1	359	72.3	24	360	71.9	358	72.4	<b>359</b>	<b>72.2</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) only on request for base runs,  
'echo madvise > /sys/kernel/mm/transparent\_hugepage/enabled' run as root.  
To enable THP for all allocations for peak runs,  
'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/cpu2017/amd_rate_aocc400_znver4_A_lib/lib:/home/cpu2017/amd_rate_aocc400_znver4_A_lib/lib32:"  
MALLOCONF = "retain:true"
```

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

```
MALLOCONF = "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

```
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on as-1015a-mt Fri Apr 19 11:40:14 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 (249.11-0ubuntu3.12)
  12. Failed units, from systemctl list-units --state=failed
  13. Services, from systemctl list-unit-files
  14. Linux kernel boot-time arguments, from /proc/cmdline
  15. cpupower frequency-info
  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
- 

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### Platform Notes (Continued)

1. `uname -a`  
Linux as-1015a-mt 6.5.0-27-generic #28~22.04.1-Ubuntu SMP PREEMPT\_DYNAMIC Fri Mar 15 10:51:06 UTC 2 x86\_64 x86\_64 x86\_64 GNU/Linux

2. `w`  
11:40:14 up 5:54, 4 users, load average: 5.97, 16.05, 17.14  
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT  
lab tty1 - 05:48 5:50m 1.66s 0.00s -bash  
lab tty2 - 05:48 4:19m 0.29s 0.00s -bash  
lab pts/0 - 05:48 4:19m 0.04s 0.28s sudo su -  
lab pts/1 - 05:48 5:50m 0.84s 1.64s sudo su -

3. Username  
From environment variable \$USER: root  
From the command 'logname': lab

4. `ulimit -a`  
time(seconds) unlimited  
file(blocks) unlimited  
data(kbytes) unlimited  
stack(kbytes) unlimited  
coredump(blocks) 0  
memory(kbytes) unlimited  
locked memory(kbytes) 2097152  
process 253488  
nofiles 1024  
vmemory(kbytes) unlimited  
locks unlimited  
rtprio 0

5. `sysinfo process ancestry`  
/lib/systemd/systemd --system --deserialize 81  
/bin/login -p --  
-bash  
sudo su -  
sudo su -  
su -  
-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/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from\_runcpu 2  
specperl \$SPEC/bin/sysinfo  
\$SPEC = /home/cpu2017

6. `/proc/cpuinfo`  
model name : AMD EPYC 4464P 12-Core Processor  
vendor\_id : AuthenticAMD  
cpu family : 25  
model : 97  
stepping : 2  
microcode : 0xa601206

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### Platform Notes (Continued)

```
bugs          : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
TLB size     : 3584 4K pages
cpu cores    : 12
siblings     : 24
1 physical ids (chips)
24 processors (hardware threads)
physical id 0: core ids 0-5,8-13
physical id 0: apicids 0-11,16-27
```

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:         48 bits physical, 48 bits virtual
Byte Order:            Little Endian
CPU(s):                24
On-line CPU(s) list:  0-23
Vendor ID:             AuthenticAMD
Model name:            AMD EPYC 4464P 12-Core Processor
CPU family:            25
Model:                 97
Thread(s) per core:   2
Core(s) per socket:   12
Socket(s):             1
Stepping:              2
CPU max MHz:           5482.0000
CPU min MHz:           400.0000
BogoMIPS:              7386.18
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 sse4_1 sse4_2
                      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 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 xsavec cqm_llc cqm_occup_llc
                      cqm_mbm_total cqm_mbm_local avx512_bf16 clzero irperf xsaveerpr rdpru
                      wbnoinvd 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 avx512vbmi umip pku ospke avx512_vbmi2
                      gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq rdpid
                      overflow_recov succor smca flush_l1d
Virtualization:        AMD-V
L1d cache:             384 KiB (12 instances)
L1i cache:             384 KiB (12 instances)
L2 cache:              12 MiB (12 instances)
L3 cache:              64 MiB (2 instances)
NUMA node(s):         1
NUMA node0 CPU(s):    0-23
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
```

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### Platform Notes (Continued)

Vulnerability Meltdown:	Not affected
Vulnerability Mmio stale data:	Not affected
Vulnerability Retbleed:	Not affected
Vulnerability Spec rstack overflow:	Mitigation; Safe RET
Vulnerability Spec store bypass:	Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1:	Mitigation; usercopy/swappgs 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	384K	8	Data	1	64	1	64
L1i	32K	384K	8	Instruction	1	64	1	64
L2	1M	12M	8	Unified	2	2048	1	64
L3	32M	64M	16	Unified	3	32768	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```

available: 1 nodes (0)
node 0 cpus: 0-23
node 0 size: 63426 MB
node 0 free: 62742 MB
node distances:
node 0
0: 10

```

9. /proc/meminfo

MemTotal: 64948376 kB

10. who -r

run-level 5 Apr 19 05:48

11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)

Default Target	Status
graphical	degraded

12. Failed units, from systemctl list-units --state=failed

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* systemd-networkd-wait-online.service	loaded	failed	failed	Wait for Network to be Configured

13. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager apparmor blk-availability cloud-config cloud-final cloud-init cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager grub-common grub-initrd-fallback irqbalance keyboard-setup lvm2-monitor lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw unattended-upgrades vgauth
enabled-runtime	netplan-ovs-cleanup systemd-fsck-root systemd-fsck-root systemd-remount-fs
disabled	console-getty debug-shell iscsid nftables rsync serial-getty@ systemd-boot-check-no-failures systemd-network-generator systemd-sysext

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### Platform Notes (Continued)

```
generated          systemd-time-wait-sync upower
indirect           apport
masked            uidd
                  cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                  x11-common
```

-----  
14. Linux kernel boot-time arguments, from /proc/cmdline  
BOOT\_IMAGE=/boot/vmlinuz-6.5.0-27-generic  
root=UUID=4f55a34d-b48a-4d81-9fd2-4c75e2c06e11  
ro

-----  
15. cpupower frequency-info  
analyzing CPU 10:  
current policy: frequency should be within 400 MHz and 5.48 GHz.  
The governor "performance" may decide which speed to use  
within this range.  
  
boost state support:  
Supported: yes  
Active: yes  
Boost States: 0  
Total States: 2  
Pstate-P0: 3700MHz

-----  
16. sysctl

kernel.numa_balancing	0
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

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### Platform Notes (Continued)

```
max_ptes_swap          64
pages_to_scan          4096
scan_sleep_millisecs   10000
```

-----  
19. OS release  
From /etc/\*-release /etc/\*-version  
os-release Ubuntu 22.04.4 LTS

-----  
20. Disk information  
SPEC is set to: /home/cpu2017  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/nvme0n1p2 ext4 879G 17G 817G 2% /

-----  
21. /sys/devices/virtual/dmi/id  
Vendor: Supermicro  
Product: Super Server  
Product Family: Family  
Serial: 0123456789

-----  
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:  
2x Micron Technology MTC16C2085S1UC56BGZ 32 GB 2 rank 5600, configured at 5200  
2x NO DIMM NO DIMM

-----  
23. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: 1.2a  
BIOS Date: 02/15/2024  
BIOS Revision: 5.32

### 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

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C | 502.gcc\_r(peak)

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C++ | 523.xalancbmk\_r(peak)

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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

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# SPEC CPU®2017 Integer Rate Result

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## Supermicro

Mainstream A+ Server AS -1015A-MT  
(H13SAE-MF , AMD EPYC 4464P)

SPECrate®2017\_int\_base = 141

SPECrate®2017\_int\_peak = 151

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** Apr-2024  
**Hardware Availability:** May-2024  
**Software Availability:** Mar-2024

## Compiler Version Notes (Continued)

-----  
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  
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

(Continued on next page)



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## Base Optimization Flags (Continued)

C benchmarks (continued):

-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

Fortran benchmarks:

-Wno-unused-command-line-argument

## Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

(Continued on next page)



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## Supermicro

Mainstream A+ Server AS -1015A-MT  
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## Peak Compiler Invocation (Continued)

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
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
-lamdalloc

505.mcf_r: basepeak = yes

525.x264_r: basepeak = yes

557.xz_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
```

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## Peak Optimization Flags (Continued)

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: -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
-lamdalloc-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 -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
```

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## Peak Other Flags (Continued)

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

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

<http://www.spec.org/cpu2017/flags/aocc400-flags-A1.2.html>

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-AM5-revA.html>

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

<http://www.spec.org/cpu2017/flags/aocc400-flags-A1.2.xml>

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-AM5-revA.xml>

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