



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL345 Gen12

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_int_base = 669

SPECrate®2017_int_peak = 683

CPU2017 License: 3

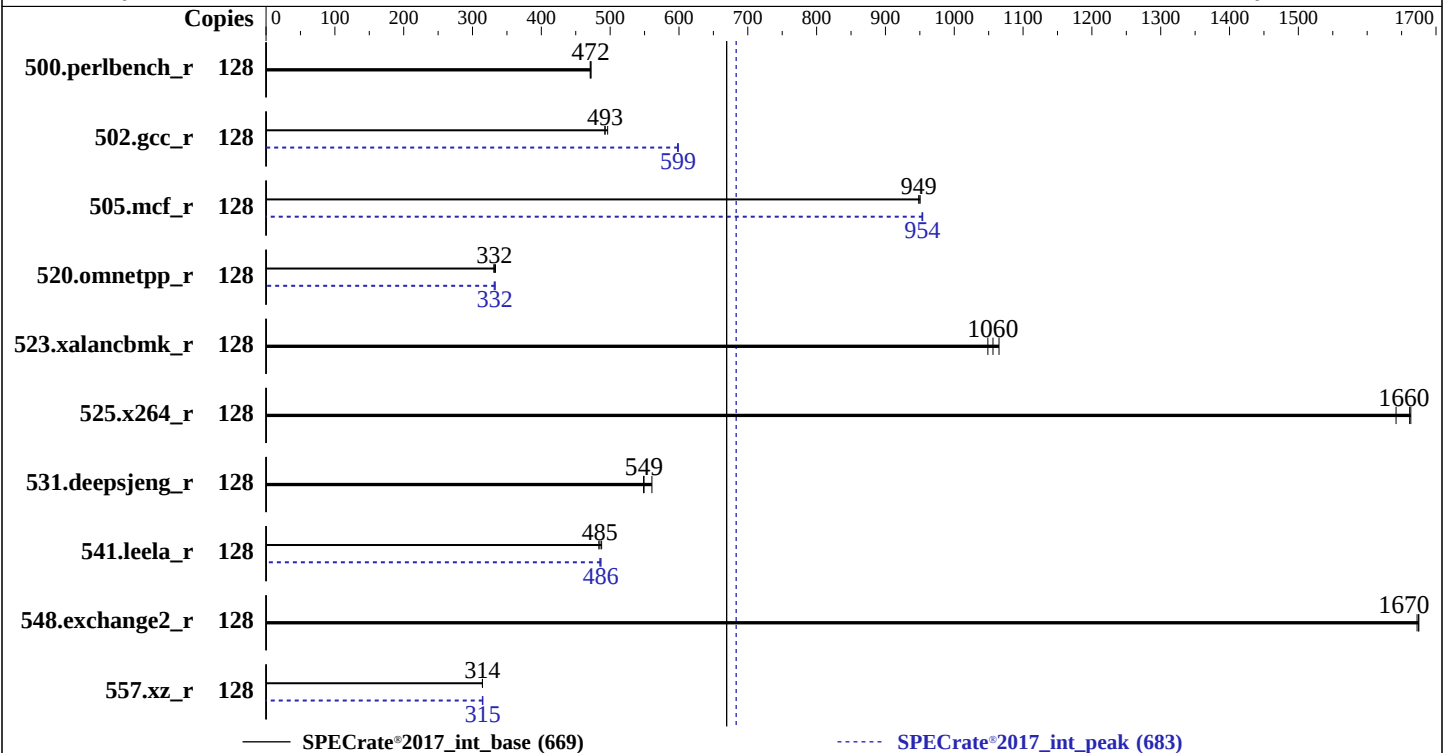
Test Sponsor: HPE

Tested by: HPE

Test Date: Sep-2025

Hardware Availability: Aug-2025

Software Availability: Oct-2024



Hardware

CPU Name: AMD EPYC 9535
Max MHz: 4300
Nominal: 2400
Enabled: 64 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 256 MB I+D on chip per chip, 16 MB shared / 4 cores
Other: None
Memory: 768 GB (12 x 64 GB 2Rx4 PC5-6400B-R, running at 5200)
Storage: 1 x 1.92 TB 64G NVME SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6
kernel 6.4.0-150600.21-default
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: HPE BIOS Version v1.20 07/11/2025 released Jul-2025
File System: ext4
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	432	472	433	471	432	472	128	432	472	433	471	432	472
502.gcc_r	128	368	493	365	496	368	492	128	303	599	303	598	303	599
505.mcf_r	128	218	949	218	949	218	950	128	217	954	217	954	217	953
520.omnetpp_r	128	508	331	504	333	506	332	128	504	333	505	332	507	331
523.xalancbmk_r	128	128	1060	129	1050	127	1070	128	128	1060	129	1050	127	1070
525.x264_r	128	137	1640	135	1660	135	1660	128	137	1640	135	1660	135	1660
531.deepsjeng_r	128	267	549	262	561	267	549	128	267	549	262	561	267	549
541.leela_r	128	435	488	437	485	438	484	128	436	487	436	486	437	485
548.exchange2_r	128	201	1670	200	1670	200	1670	128	201	1670	200	1670	200	1670
557.xz_r	128	440	314	440	314	439	315	128	439	315	439	315	440	314

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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/cpu2017/amd_rate_aocc500_znver5_A_lib/lib:/home/cpu2017/amd_rate_aocc500_znver5_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 Configurations : Parameters are selected in the order shown below

Workload Profile set to High Performance Compute (HPC)

Determinism Control set to Manual

Performance Determinism set to Power Deterministic

Memory Patrol Scrubbing set to Disabled

ACPI CST C2 Latency set to 18 microseconds

Last-Level Cache (LLC) as NUMA Node set to Enabled

NUMA memory domains per socket set to Four memory domains per socket

Thermal Configuration set to Enhanced CPU Cooling

AMD Periodic Directory Rinse set to Periodic

Workload Profile set to Custom

Power Regulator set to OS Control Mode

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on r15-bm-02 Sun Sep 14 20:34:20 2025

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

Table of contents

1. uname -a
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Platform Notes (Continued)

```
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 r15-bm-02 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09/lp)
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
20:34:20 up 3 days, 10:22, 7 users, load average: 0.07, 0.02, 0.00
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root      pts/2    10.79.30.183:5  19:01    11.00s 0.93s  0.04s /bin/bash ./amd_rate_aocc500_znver5_A1.sh
root      pts/4    10.79.30.183    19:50    11:22  0.05s  0.05s -bash
```

```
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) 3094496
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) 3094496
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
```

```
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@pts/0
-bash
screen -S cpu
SCREEN -S cpu
/bin/bash
python3 ./run_intrate.py
/bin/bash ./amd_rate_aocc500_znver5_A1.sh
runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intrate
runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.066/temlogs/preenv.intrate.066.0.log --lognum 066.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
```

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Platform Notes (Continued)

\$SPEC = /home/cpu2017

6. /proc/cpuinfo

```
model name      : AMD EPYC 9535 64-Core Processor
vendor_id       : AuthenticAMD
cpu family      : 26
model           : 2
stepping        : 1
microcode       : 0xb002151
bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size        : 192 4K pages
cpu cores       : 64
siblings        : 128
1 physical ids (chips)
128 processors (hardware threads)
physical id 0: core ids 0-63
physical id 0: apicids 0-127
```

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 2.39.3:

```
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
Model name:         AMD EPYC 9535 64-Core Processor
CPU family:         26
Model:              2
Thread(s) per core: 2
Core(s) per socket: 64
Socket(s):          1
Stepping:           1
Frequency boost:    enabled
CPU(s) scaling MHz: 107%
CPU max MHz:        2400.0000
CPU min MHz:        1500.0000
BogoMIPS:           4799.88
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 aperfmpperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid
                   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 tsc_adjust 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 user_shstk avx_vnni 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
```

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Platform Notes (Continued)

Virtualization:

L1d cache:

L1i cache:

L2 cache:

L3 cache:

NUMA node(s):

NUMA node0 CPU(s):

NUMA node1 CPU(s):

NUMA node2 CPU(s):

NUMA node3 CPU(s):

NUMA node4 CPU(s):

NUMA node5 CPU(s):

NUMA node6 CPU(s):

NUMA node7 CPU(s):

NUMA node8 CPU(s):

NUMA node9 CPU(s):

NUMA node10 CPU(s):

NUMA node11 CPU(s):

NUMA node12 CPU(s):

NUMA node13 CPU(s):

NUMA node14 CPU(s):

NUMA node15 CPU(s):

Vulnerability Gather data sampling:

Vulnerability Itlb multihit:

Vulnerability L1tf:

Vulnerability Mds:

Vulnerability Meltdown:

Vulnerability Mmio stale data:

Vulnerability Reg file data sampling:

Vulnerability Retbleed:

Vulnerability Spec rstack overflow:

Vulnerability Spec store bypass:

Vulnerability Spectre v1:

Vulnerability Spectre v2:

Vulnerability Srbds:

Vulnerability Tsx async abort:

avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid bus_lock_detect
movdiri movdir64b overflow_recov succor smca fsrm avx512_vp2intersect
flush_l1d debug_swap

AMD-V

3 MiB (64 instances)

2 MiB (64 instances)

64 MiB (64 instances)

256 MiB (16 instances)

16

0-3,64-67

4-7,68-71

8-11,72-75

12-15,76-79

16-19,80-83

20-23,84-87

24-27,88-91

28-31,92-95

32-35,96-99

36-39,100-103

40-43,104-107

44-47,108-111

48-51,112-115

52-55,116-119

56-59,120-123

60-63,124-127

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Mitigation; Speculative Store Bypass disabled via prctl

Mitigation; usercopy/swaps barriers and __user pointer sanitization

Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP

always-on; RSB filling; PBRBS-eIBRS Not affected; BHI Not affected

Not affected

Not affected

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	3M	12	Data	1	64	1	64
L1i	32K	2M	8	Instruction	1	64	1	64
L2	1M	64M	16	Unified	2	1024	1	64
L3	16M	256M	16	Unified	3	16384	1	64

8. numactl --hardware

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

available: 16 nodes (0-15)

node 0 cpus: 0-3,64-67

node 0 size: 48065 MB

node 0 free: 47851 MB

node 1 cpus: 4-7,68-71

node 1 size: 48381 MB

node 1 free: 48197 MB

node 2 cpus: 8-11,72-75

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Platform Notes (Continued)

node 2 size: 48381 MB
node 2 free: 48191 MB
node 3 cpus: 12-15,76-79
node 3 size: 48381 MB
node 3 free: 48199 MB
node 4 cpus: 16-19,80-83
node 4 size: 48381 MB
node 4 free: 48116 MB
node 5 cpus: 20-23,84-87
node 5 size: 48381 MB
node 5 free: 48177 MB
node 6 cpus: 24-27,88-91
node 6 size: 48381 MB
node 6 free: 48197 MB
node 7 cpus: 28-31,92-95
node 7 size: 48381 MB
node 7 free: 48161 MB
node 8 cpus: 32-35,96-99
node 8 size: 48381 MB
node 8 free: 48152 MB
node 9 cpus: 36-39,100-103
node 9 size: 48381 MB
node 9 free: 48191 MB
node 10 cpus: 40-43,104-107
node 10 size: 48343 MB
node 10 free: 48152 MB
node 11 cpus: 44-47,108-111
node 11 size: 48381 MB
node 11 free: 48231 MB
node 12 cpus: 48-51,112-115
node 12 size: 48381 MB
node 12 free: 47725 MB
node 13 cpus: 52-55,116-119
node 13 size: 48381 MB
node 13 free: 48156 MB
node 14 cpus: 56-59,120-123
node 14 size: 48381 MB
node 14 free: 48071 MB
node 15 cpus: 60-63,124-127
node 15 size: 48283 MB
node 15 free: 47951 MB

node distances:

node	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0:	10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12
1:	11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12
2:	11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	12
3:	11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	12
4:	12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	12
5:	12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	12
6:	12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	12
7:	12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	12
8:	12	12	12	12	12	12	12	10	11	11	11	12	12	12	12	12
9:	12	12	12	12	12	12	12	11	10	11	11	12	12	12	12	12
10:	12	12	12	12	12	12	12	11	11	10	11	12	12	12	12	12
11:	12	12	12	12	12	12	12	11	11	11	10	12	12	12	12	12
12:	12	12	12	12	12	12	12	12	12	12	12	10	11	11	11	11
13:	12	12	12	12	12	12	12	12	12	12	12	11	10	11	11	11
14:	12	12	12	12	12	12	12	12	12	12	12	11	11	10	11	11
15:	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	10

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Platform Notes (Continued)

9. /proc/meminfo

MemTotal: 792222580 kB

10. who -r

run-level 5 Jul 7 07:00

11. Systemd service manager version: systemd 254 (254.27+suse.167.g130293e510)

Default Target Status
graphical degraded

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

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* yast-timesync.service	loaded	failed	failed	One time sync configured by YaST

13. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd bluetooth chronyd cron display-manager getty@ irqbalance iscsi issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections nvme-fc-autoconnect oracle postfix purge-kernels rollback rsyslog sapconf smartd sshd sysctl-logger systemd-pstore virtgemud virtxend wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant xencommons
enabled-runtime	systemd-fsck-root systemd-remount-fs
disabled	NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon amavis apache2 apache2@ autofs autoyast-initscripts bgpd blk-availability bluetooth-mesh boot-sysctl booth-arbitrator booth@ ca-certificates certmonger chrony-wait clamav-milter clamd clamonnacc console-getty corosync corosync-notifyd crm_mon ctdd cups cups-browsed ddclient debug-shell dhcpd dhcpd6 dhcrelay dhcrelay6 dirsrv@ dlm dnsmasq drbd drbd-lvchange@ drbd-wait-promotable@ ebttables exchange-bmc-os-info fetchmail firewallld fsidd gpm grub2-once haveged hawk hwloc-dump-hwdata ipmi ipmievdp ipvsadm iscsi-init iscsid isisd issue-add-ssh-keys kexec-load ksm kvm_stat ldirectord libvirt-guests logd lunmask lvmlockd lvmlocks man-db-create mariadb mariadb@ multipathd named nfs nfs-blkmap nfs-server nfsserver nmb openvpn@ ospf6d ospfd ostree-remount pacemaker racoon racoon-setkey radvd rarpd@ ripd ripngd rpcbind rpmconfigcheck rsyncd rtkit-daemon sanlock sbd sbd_remote serial-getty@ smartd generate_opts smb snmpd snmptrapd spamd spamd speech-dispatcherd squid srp_daemon srp_daemon_port@ strongswan strongswan-starter svnserv sysstat systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-nspawn@ systemd-sysext systemd-time-wait-sync systemd-timesyncd tcsd udisks2 update-system-flatpaks upower virtinterfaced virtlockd virtlogd virtnetworkd virtnodeudev virtnwfilterd virtsecret virtstoraged vncserver@ vsftpd wdm winbind wpa_supplicant@ xen-dom0-modules xen-init-dom0 xen-qemu-dom0-disk-backend xen-watchdog xenconsoled xendomains xenstored zebra
indirect	pcscd saned@ systemd-userdbd tftp uuidd wickedd

14. Linux kernel boot-time arguments, from /proc/cmdline

BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=566b550a-b4e8-48d0-9bfc-e3063e24f965
splash=silent
mitigations=auto
quiet
security=apparmor

15. cpupower frequency-info

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Platform Notes (Continued)

analyzing CPU 88:

current policy: frequency should be within 1.50 GHz and 2.40 GHz.

The governor "performance" may decide which speed to use within this range.

boost state support:

Supported: yes

Active: yes

```
-----
16. sysctl
   kernel.numa_balancing          0
   kernel.randomize_va_space     0
   vm.compaction_proactiveness    20
   vm.dirty_background_bytes      314572800
   vm.dirty_background_ratio      0
   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 SUSE Linux Enterprise Server 15 SP6
-----
```

```
-----
20. Disk information
SPEC is set to: /home/cpu2017
   Filesystem  Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p3 ext4  1.8T   20G  1.7T   2% /
-----
```

```
-----
21. /sys/devices/virtual/dmi/id
-----
```

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ProLiant Compute DL345 Gen12

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_int_base = 669

SPECrate®2017_int_peak = 683

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Sep-2025

Hardware Availability: Aug-2025

Software Availability: Oct-2024

Platform Notes (Continued)

Vendor: HPE
Product: HPE ProLiant Compute DL345 Gen12
Product Family: ProLiant
Serial: SANJACSCM

22. dmidecode

Additional information from dmidecode 3.6 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:

9x Hynix HMC694AHBRA480N 64 GB 2 rank 6400, configured at 5200
1x Micron MTC40F2046S1RC64BD2 MWFF 64 GB 2 rank 6400, configured at 5200
2x Micron MTC40F2046S1RC64BD2 QSFF 64 GB 2 rank 6400, configured at 5200

23. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: HPE
BIOS Version: 1.20
BIOS Date: 07/11/2025
BIOS Revision: 1.20
Firmware Revision: 1.16

Compiler Version Notes

C | 502.gcc_r(peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

C | 502.gcc_r(peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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)

(Continued on next page)



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Compiler Version Notes (Continued)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

```
Fortran | 548.exchange2_r(base, peak)
```

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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

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Base Portability Flags (Continued)

557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc-ext -ldl
```

C++ benchmarks:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext
-ldl
```

Fortran benchmarks:

```
-m64 -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=znver5
-fveclib=AMDLIBM -ffast-math -flto
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500
-lamdlibm -lflang -lamdalloc -ldl
```

Base Other Flags

C benchmarks:

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

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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 -wl,-mllvm -wl,-ldist-scalar-expand

-fenable-aggressive-gather -wl,-mllvm -wl,-extra-inliner

-z muldefs -Ofast -march=znver5 -fveclib=AMDLIBM

-ffast-math -fstruct-layout=7 -mllvm -unroll-threshold=50

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Peak Optimization Flags (Continued)

502.gcc_r (continued):

```
-fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline  
-lamdalloc
```

```
505.mcf_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5  
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7  
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm  
-lflang -lamdalloc-ext -ldl
```

525.x264_r: basepeak = yes

```
557.xz_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-ldist-scalar-expand  
-fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner  
-Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -flto  
-fstruct-layout=7 -mllvm -unroll-threshold=50  
-fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm  
-lflang -lamdalloc-ext -ldl
```

C++ benchmarks:

```
520.omnetpp_r: -m64 -std=c++14  
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto  
-mllvm -unroll-threshold=100  
-mllvm -reduce-array-computations=3 -zopt -fno-PIE  
-no-pie -fvirtual-function-elimination -fvisibility=hidden  
-mllvm -do-block-reorder=advanced -lamdlibm -lamdalloc-ext  
-ldl
```

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

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Peak Optimization Flags (Continued)

```
541.leela_r: -m64 -std=c++14
-Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
-Wl, -mllvm -Wl, -reduce-array-computations=3
-Wl, -mllvm -Wl, -do-block-reorder=advanced -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -fno-PIE
-no-pie -fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang
-lamdalloc-ext -ldl
```

Fortran benchmarks:

548.exchange2_r: basepeak = yes

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/aocc5/1316/amd_rate_aocc500_znver5_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/HPE-Platform-Flags-AMD-Turin-rev1.8.html>

<http://www.spec.org/cpu2017/flags/aocc500-flags.html>

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.8.xml>

<http://www.spec.org/cpu2017/flags/aocc500-flags.xml>

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