



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11

(2.30 GHz, AMD EPYC 9645)

SPECspeed®2017_int_base = 16.1

SPECspeed®2017_int_peak = 16.2

CPU2017 License: 3

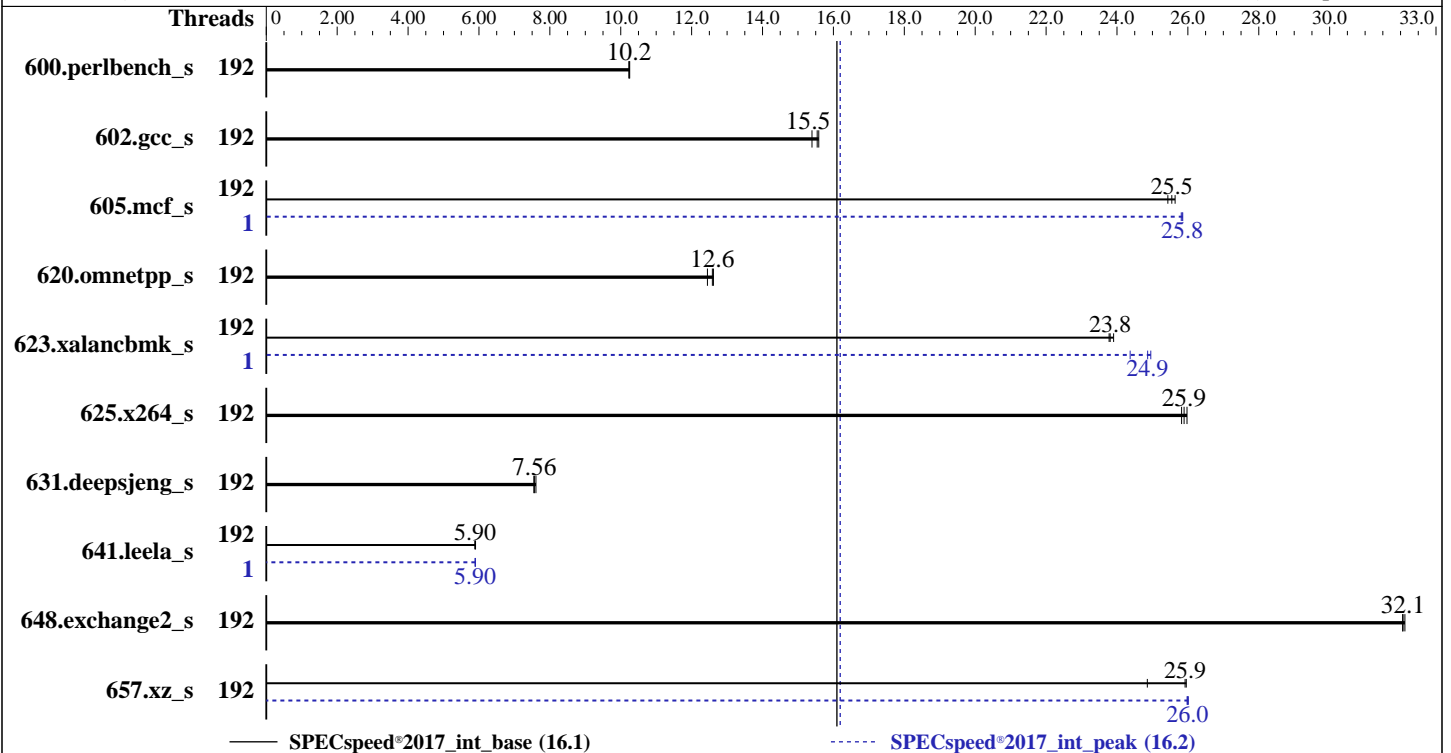
Test Sponsor: HPE

Tested by: HPE

Test Date: Nov-2024

Hardware Availability: Jan-2025

Software Availability: Sep-2024



Hardware

CPU Name: AMD EPYC 9645
 Max MHz: 3700
 Nominal: 2300
 Enabled: 192 cores, 2 chips
 Orderable: 1,2 chips
 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,
 32 MB shared / 12 cores
 Other: None
 Memory: 768 GB (24 x 32 GB 2Rx8 PC5-6400B-R,
 running at 6000)
 Storage: 1 x 480 GB SATA SSD
 Other: CPU Cooling: DLC

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: Yes
 Firmware: HPE BIOS Version v2.20 10/31/2024 released
 Oct-2024
 File System: btrfs
 System State: Run level 5 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 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						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	192	173	10.2	173	10.2	173	10.3	192	173	10.2	173	10.2	173	10.3
602.gcc_s	192	255	15.6	256	15.5	259	15.4	192	255	15.6	256	15.5	259	15.4
605.mcf_s	192	184	25.6	186	25.4	185	25.5	1	183	25.9	183	25.8	183	25.8
620.omnetpp_s	192	129	12.6	130	12.6	131	12.4	192	129	12.6	130	12.6	131	12.4
623.xalancbmk_s	192	59.5	23.8	59.6	23.8	59.3	23.9	1	56.8	25.0	57.0	24.9	58.1	24.4
625.x264_s	192	67.9	26.0	68.1	25.9	68.3	25.8	192	67.9	26.0	68.1	25.9	68.3	25.8
631.deepsjeng_s	192	190	7.55	189	7.56	188	7.61	192	190	7.55	189	7.56	188	7.61
641.leela_s	192	289	5.90	290	5.88	289	5.90	1	289	5.90	289	5.89	289	5.90
648.exchange2_s	192	91.5	32.1	91.7	32.1	91.7	32.1	192	91.5	32.1	91.7	32.1	91.7	32.1
657.xz_s	192	238	26.0	238	25.9	249	24.9	192	238	26.0	238	26.0	238	26.0

SPECspeed®2017_int_base = **16.1**

SPECspeed®2017_int_peak = **16.2**

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:

GOMP_CPU_AFFINITY = "0-191"

LD_LIBRARY_PATH =

"/home/cpu2017/amd_speed_aocc500_znver5_A_lib/lib:/home/cpu2017/amd_speed_aocc500_znver5_A_lib/lib32:"

LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"

MALLOC_CONF = "retain:true"

OMP_DYNAMIC = "false"

OMP_SCHEDULE = "static"

OMP_STACKSIZE = "128M"

OMP_THREAD_LIMIT = "192"

Environment variables set by runcpu during the 605.mcf_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 641.leela_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz_s peak run:

GOMP_CPU_AFFINITY = "0-191"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

Platform Notes

BIOS Configuration

Workload Profile set to General Peak Frequency Compute

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

Thermal Configuration set to Maximum Cooling

AMD SMT Option set to Disabled

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

Workload Profile set to Custom

Power Regulator set to OS Control Mode

The reference code/AGESA version used in this ROM is version Turin-PI 1.0.0.2

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on localhost Thu Nov 21 13:12:16 2024

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

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Platform Notes (Continued)

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 254 (254.10+suse.84.ge8d77af424)
- 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
- 22. dmidecode
- 23. BIOS

```
1. uname -a
Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
13:12:16 up 45 min, 3 users, load average: 0.07, 0.02, 0.08
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root pts/0 10.30.195.96 13:11 16.00s 0.90s 0.08s /bin/bash ./amd_speed_aocc500_znver5_A1.sh
```

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

```
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 3094363
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) 3094363
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
```

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Platform Notes (Continued)

```

-----
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
python3 ./run_intspeed.py
/bin/bash ./amd_speed_aocc500_znver5_A1.sh
runcpu --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intspeed
runcpu --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeed intspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.002/templogs/preenv.intspeed.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9645 96-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 26
model          : 17
stepping       : 0
microcode      : 0xb101025
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size       : 192 4K pages
cpu cores      : 96
siblings       : 96
2 physical ids (chips)
192 processors (hardware threads)
physical id 0: core ids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
physical id 1: core ids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
physical id 1: apicids 128-139,144-155,160-171,176-187,192-203,208-219,224-235,240-251
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):                 192
On-line CPU(s) list:   0-191
Vendor ID:              AuthenticAMD
BIOS Vendor ID:        Advanced Micro Devices, Inc.
Model name:             AMD EPYC 9645 96-Core Processor
BIOS Model name:       AMD EPYC 9645 96-Core Processor
BIOS CPU family:       107
CPU family:             26
Model:                  17
Thread(s) per core:    1
Core(s) per socket:    96
Socket(s):              2
Stepping:               0
Frequency boost:       enabled

```

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Platform Notes (Continued)

```

CPU(s) scaling MHz:          101%
CPU max MHz:                2300.0000
CPU min MHz:                 1500.0000
BogoMIPS:                    4593.19
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 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 bpeext
                               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
                               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_lld debug_swap
AMD-V
L1d cache:                   9 MiB (192 instances)
L1i cache:                    6 MiB (192 instances)
L2 cache:                     192 MiB (192 instances)
L3 cache:                     512 MiB (16 instances)
NUMA node(s):                 8
NUMA node0 CPU(s):           0-23
NUMA node1 CPU(s):           24-47
NUMA node2 CPU(s):           48-71
NUMA node3 CPU(s):           72-95
NUMA node4 CPU(s):           96-119
NUMA node5 CPU(s):           120-143
NUMA node6 CPU(s):           144-167
NUMA node7 CPU(s):           168-191
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 Reg file data sampling: Not affected
Vulnerability Retbleed:           Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass:   Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1:          Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:          Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                   disabled; RSB filling; PBRSE-eIBRS Not affected; BHI 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	48K	9M	12	Data	1	64	1	64
L1i	32K	6M	8	Instruction	1	64	1	64
L2	1M	192M	16	Unified	2	1024	1	64
L3	32M	512M	16	Unified	3	32768	1	64

(Continued on next page)



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Platform Notes (Continued)

8. numactl --hardware

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

available: 8 nodes (0-7)

node 0 cpus: 0-23

node 0 size: 96446 MB

node 0 free: 95944 MB

node 1 cpus: 24-47

node 1 size: 96723 MB

node 1 free: 96069 MB

node 2 cpus: 48-71

node 2 size: 96761 MB

node 2 free: 96257 MB

node 3 cpus: 72-95

node 3 size: 96761 MB

node 3 free: 96401 MB

node 4 cpus: 96-119

node 4 size: 96761 MB

node 4 free: 96648 MB

node 5 cpus: 120-143

node 5 size: 96761 MB

node 5 free: 96633 MB

node 6 cpus: 144-167

node 6 size: 96761 MB

node 6 free: 96660 MB

node 7 cpus: 168-191

node 7 size: 96644 MB

node 7 free: 96288 MB

node distances:

node	0	1	2	3	4	5	6	7
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: 792188240 kB

10. who -r

run-level 5 Nov 21 12:27

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)

Default Target	Status
graphical	running

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd bluetooth cron display-manager getty@ irqbalance issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant

(Continued on next page)



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Platform Notes (Continued)

```

enabled-runtime systemd-remount-fs
disabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofsd
autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
chrony-wait chronyd console-getty cups cups-browsed debug-shell dnsmasq ebttables
exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd
issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb openvpn@
ostree-remount rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@
smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
systemd-confext systemd-network-generator systemd-sysextd systemd-time-wait-sync
systemd-timesyncd tuned udisks2 update-system-flatpaks upower vncserver@ wpa_supplicant@
indirect pcsd saned@ systemd-userdbd wickedd

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=c70d6b0a-e893-482b-b564-48624143e39e
splash=silent
mitigations=auto
quiet
security=apparmor

```

```

-----
14. cpupower frequency-info
analyzing CPU 23:
  current policy: frequency should be within 1.50 GHz and 2.30 GHz.
                   The governor "performance" may decide which speed to use
                   within this range.

  boost state support:
    Supported: yes
    Active: yes

```

```

-----
15. tuned-adm active
  No current active profile.

```

```

-----
16. sysctl
kernel.numa_balancing          1
kernel.randomize_va_space      0
vm.compaction_proactiveness    20
vm.dirty_background_bytes      0
vm.dirty_background_ratio     10
vm.dirty_bytes                 0
vm.dirty_expire_centisecs     3000
vm.dirty_ratio                 8
vm.dirty_writeback_centisecs   500
vm.dirtytime_expire_seconds   43200
vm.extfrag_threshold           500
vm.min_unmapped_ratio          1
vm.nr_hugepages                0
vm.nr_hugepages_mempolicy      0
vm.nr_overcommit_hugepages     0
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

```

(Continued on next page)



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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/sda3 btrfs 407G 23G 383G 6% /home

21. /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL385 Gen11
Product Family: ProLiant
Serial: DL385G11-006

22. dmidecode
Additional information from dmidecode 3.4 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 Hynix HMC88AHBRA471N 32 GB 2 rank 6400, configured at 6000

23. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: HPE
BIOS Version: 2.20
BIOS Date: 10/31/2024
BIOS Revision: 2.20
Firmware Revision: 1.63

Compiler Version Notes

=====
C | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)
| 657.xz_s(base, peak)
=====

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

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ProLiant DL385 Gen11

(2.30 GHz, AMD EPYC 9645)

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SPECspeed®2017_int_peak = 16.2

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Nov-2024

Hardware Availability: Jan-2025

Software Availability: Sep-2024

Compiler Version Notes (Continued)

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

=====
C++ | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)
| 641.leela_s(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 | 648.exchange2_s(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

600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LINUX -DSPEC_LP64
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64



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Base Optimization Flags

C benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-extra-inliner -O3
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP
-flto -fremap-arrays -fstrip-mining -fstruct-layout=7
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp -lamdlibm
-lflang -lamdalloc
```

C++ benchmarks:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=100 -zopt
-fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-iv-split -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -O3 -march=znver5 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

Base Other Flags

C benchmarks:

```
-Wno-return-type -Wno-unused-command-line-argument
```

C++ benchmarks:

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

Fortran benchmarks:

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



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CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Nov-2024

Hardware Availability: Jan-2025

Software Availability: Sep-2024

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

600.perlbench_s: basepeak = yes

602.gcc_s: basepeak = yes

605.mcf_s: -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 -fopenmp -flto
-DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang

625.x264_s: basepeak = yes

657.xz_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp

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Peak Optimization Flags (Continued)

657.xz_s (continued):

-lamdlibm -lamdalloc -lflang

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -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 -fopenmp

-flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3

-mllvm -unroll-threshold=100 -zopt

-fvirtual-function-elimination -fvisibility=hidden

-mllvm -do-block-reorder=advanced -fopenmp=libomp -lomp

-lamdlibm -lamdalloc-ext -lflang

631.deepsjeng_s: basepeak = yes

641.leela_s: -m64 -std=c++14

-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast

-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp

-flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3

-mllvm -unroll-threshold=100 -zopt

-fvirtual-function-elimination -fvisibility=hidden

-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

Fortran benchmarks:

648.exchange2_s: basepeak = yes

Peak Other Flags

C benchmarks:

-Wno-return-type -Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument



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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-rev1.0.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-rev1.0.xml>

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

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