



SPEC CPU®2017 Integer Speed Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11

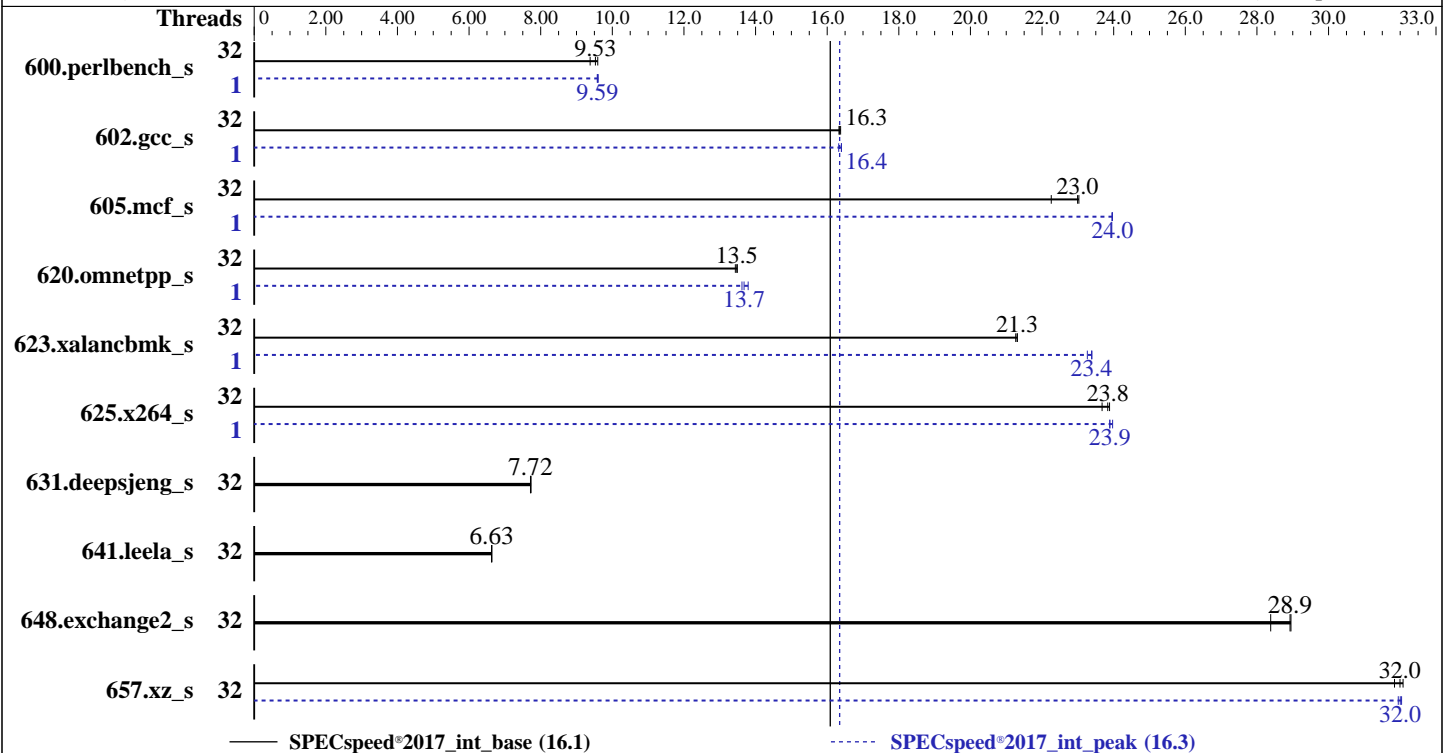
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.1

SPECspeed®2017_int_peak = 16.3

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Oct-2023
Hardware Availability: Oct-2023
Software Availability: Apr-2023



Hardware

CPU Name: AMD EPYC 9184X
 Max MHz: 4200
 Nominal: 3550
 Enabled: 32 cores, 2 chips
 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: 768 MB I+D on chip per chip,
 96 MB shared / 2 cores
 Other: None
 Memory: 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
 Storage: 1 x 480 GB SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4
 Kernel 5.14.21-150400.22-default
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
 Parallel: Yes
 Firmware: HPE BIOS Version v1.50 10/04/2023 released
 Oct-2023
 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	32	186	9.53	185	9.59	189	9.38	1	185	9.58	185	9.61	185	9.59
602.gcc_s	32	244	16.3	243	16.4	244	16.3	1	243	16.4	244	16.3	243	16.4
605.mcf_s	32	205	23.0	212	22.3	205	23.0	1	197	24.0	197	24.0	197	24.0
620.omnetpp_s	32	121	13.4	121	13.5	121	13.5	1	119	13.7	120	13.6	118	13.8
623.xalancbmk_s	32	66.5	21.3	66.5	21.3	66.6	21.3	1	60.6	23.4	60.9	23.3	60.6	23.4
625.x264_s	32	74.0	23.8	73.9	23.9	74.5	23.7	1	73.6	24.0	73.8	23.9	73.8	23.9
631.deepsjeng_s	32	186	7.72	186	7.71	185	7.73	32	186	7.72	186	7.71	185	7.73
641.leela_s	32	257	6.63	257	6.63	257	6.63	32	257	6.63	257	6.63	257	6.63
648.exchange2_s	32	102	28.9	104	28.4	102	28.9	32	102	28.9	104	28.4	102	28.9
657.xz_s	32	194	31.8	193	32.1	193	32.0	32	193	32.0	193	32.0	194	31.9

SPECspeed®2017_int_base = **16.1**

SPECspeed®2017_int_peak = **16.3**

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 = "0-31"
LD_LIBRARY_PATH = "/home/cpu2k17/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"
```

Environment variables set by runcpu during the 600.perlbench_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 602.gcc_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

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

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 620.omnetpp_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

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

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 625.x264_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

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

```
GOMP_CPU_AFFINITY = "0-31"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "8"
```

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

AMD SMT Option set to Disabled

Memory Patrol Scrubbing set to Disabled

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

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

ACPI CST C2 Latency set to 18 microseconds

Memory PStates set to Disabled

Thermal Configuration set to Maximum Cooling

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Platform Notes (Continued)

Workload Profile set to Custom

Power Regulator set to OS Control Mode

The system ROM used for this result contains microcode version 0xa10123e for the AMD EPYC 9nn4X family of processors. The reference code/AGESA version used in this ROM is version Genoa-XPI 1.0.0.9

Sysinfo program /home/cpu2k17/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Mon Oct 30 10:02:36 2023

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+suse.124.g2bc0b2c447)
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 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222/lp)
x86_64 x86_64 x86_64 GNU/Linux

2. w
10:02:37 up 5 min, 3 users, load average: 1.42, 0.82, 0.35

USER	TTY	FROM	LOGIN@	IDLE	JCPU	PCPU	WHAT
root	:	:	29Apr22	?xdm?	45.95s	0.02s	gdm-session-worker [pam/gdm-password]
root	:1	:1	29Apr22	?xdm?	45.95s	0.00s	/usr/lib/gdm/gdm-x-session
--register-session --run-script gnome							
root	pts/1	172.17.1.13	29Apr22	28.00s	1.01s	0.08s	/bin/bash ./amd_speed_aocc400_znver4_A1.sh

3. Username
From environment variable \$USER: root

4. ulimit -a

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Platform Notes (Continued)

```

core file size      (blocks, -c) unlimited
data seg size      (kbytes, -d) unlimited
scheduling priority (-e) 0
file size          (blocks, -f) unlimited
pending signals    (-i) 3094800
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) 3094800
virtual memory     (kbytes, -v) unlimited
file locks         (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root@pts/1
-bash
python3 ./run_intspeed_znver4_A1_2.py
/bin/bash ./amd_speed_aocc400_znver4_A1.sh
runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 intspeerd
runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeed intspeerd --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.037/templogs/preenv.intspeed.037.0.log --lognum 037.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2k17

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9184X 16-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 17
stepping       : 2
microcode      : 0xa10123e
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 3584 4K pages
cpu cores     : 16
siblings      : 16
2 physical ids (chips)
32 processors (hardware threads)
physical id 0: core ids 0-15
physical id 1: core ids 0-15
physical id 0: apicids 0-15
physical id 1: apicids 16-31
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: 52 bits physical, 57 bits virtual

```

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Platform Notes (Continued)

```

Byte Order:                Little Endian
CPU(s):                    32
On-line CPU(s) list:      0-31
Vendor ID:                 AuthenticAMD
Model name:               AMD EPYC 9184X 16-Core Processor
CPU family:               25
Model:                    17
Thread(s) per core:      1
Core(s) per socket:      16
Socket(s):                2
Stepping:                 2
Frequency boost:          enabled
CPU max MHz:              3550.0000
CPU min MHz:              1500.0000
BogoMIPS:                 7089.69
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 pdpelgb rdtscp lm
                           constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf 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 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 avx512v1 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
AMD-V
Virtualization:           AMD-V
L1d cache:                1 MiB (32 instances)
L1i cache:                1 MiB (32 instances)
L2 cache:                 32 MiB (32 instances)
L3 cache:                 1.5 GiB (16 instances)
NUMA node(s):            16
NUMA node0 CPU(s):       0,1
NUMA node1 CPU(s):       2,3
NUMA node2 CPU(s):       4,5
NUMA node3 CPU(s):       6,7
NUMA node4 CPU(s):       8,9
NUMA node5 CPU(s):       10,11
NUMA node6 CPU(s):       12,13
NUMA node7 CPU(s):       14,15
NUMA node8 CPU(s):       16,17
NUMA node9 CPU(s):       18,19
NUMA node10 CPU(s):      20,21
NUMA node11 CPU(s):      22,23
NUMA node12 CPU(s):      24,25
NUMA node13 CPU(s):      26,27
NUMA node14 CPU(s):      28,29
NUMA node15 CPU(s):      30,31
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 and seccomp
Vulnerability Spectre v1:  Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:  Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP disabled, RSB

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Platform Notes (Continued)

	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	1M	8	Data	1	64	1	64
L1i	32K	1M	8	Instruction	1	64	1	64
L2	1M	32M	8	Unified	2	2048	1	64
L3	96M	1.5G	16	Unified	3	98304	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: 0-1
node 0 size: 48072 MB
node 0 free: 47474 MB
node 1 cpus: 2-3
node 1 size: 48383 MB
node 1 free: 48214 MB
node 2 cpus: 4-5
node 2 size: 48383 MB
node 2 free: 48175 MB
node 3 cpus: 6-7
node 3 size: 48383 MB
node 3 free: 48253 MB
node 4 cpus: 8-9
node 4 size: 48383 MB
node 4 free: 48265 MB
node 5 cpus: 10-11
node 5 size: 48383 MB
node 5 free: 48307 MB
node 6 cpus: 12-13
node 6 size: 48383 MB
node 6 free: 48312 MB
node 7 cpus: 14-15
node 7 size: 48383 MB
node 7 free: 48267 MB
node 8 cpus: 16-17
node 8 size: 48383 MB
node 8 free: 48258 MB
node 9 cpus: 18-19
node 9 size: 48383 MB
node 9 free: 48213 MB
node 10 cpus: 20-21
node 10 size: 48383 MB
node 10 free: 48293 MB
node 11 cpus: 22-23
node 11 size: 48383 MB
node 11 free: 48200 MB
node 12 cpus: 24-25
node 12 size: 48348 MB
node 12 free: 48071 MB
node 13 cpus: 26-27
node 13 size: 48383 MB
node 13 free: 48277 MB
node 14 cpus: 28-29
node 14 size: 48383 MB
node 14 free: 48317 MB

```

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Platform Notes (Continued)

node 15 cpus: 30-31
node 15 size: 48320 MB
node 15 free: 48131 MB
node distances:

node	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0:	10	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
1:	11	10	12	12	12	12	12	12	32	32	32	32	32	32	32	32
2:	12	12	10	11	12	12	12	12	32	32	32	32	32	32	32	32
3:	12	12	11	10	12	12	12	12	32	32	32	32	32	32	32	32
4:	12	12	12	12	10	11	12	12	32	32	32	32	32	32	32	32
5:	12	12	12	12	11	10	12	12	32	32	32	32	32	32	32	32
6:	12	12	12	12	12	12	10	11	32	32	32	32	32	32	32	32
7:	12	12	12	12	12	12	11	10	32	32	32	32	32	32	32	32
8:	32	32	32	32	32	32	32	32	10	11	12	12	12	12	12	12
9:	32	32	32	32	32	32	32	32	11	10	12	12	12	12	12	12
10:	32	32	32	32	32	32	32	32	12	12	10	11	12	12	12	12
11:	32	32	32	32	32	32	32	32	12	12	11	10	12	12	12	12
12:	32	32	32	32	32	32	32	32	12	12	12	12	10	11	12	12
13:	32	32	32	32	32	32	32	32	12	12	12	12	11	10	12	12
14:	32	32	32	32	32	32	32	32	12	12	12	12	12	12	10	11
15:	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11	10

9. /proc/meminfo
MemTotal: 792294520 kB

10. who -r
run-level 5 Apr 29 17:30

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
Default Target Status
graphical running

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager firewalld getty@ haveged irqbalance iscsi issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant
enabled-runtime	systemd-remount-fs
disabled	NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon appstream-sync-cache autofs autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell dmraid-activation dnsmasq ebttables exchange-bmc-os-info gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd iscsi-init iscsid iscsiuiio issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nm-cloud-setup nmb openvpn@ ostree-remount pppoe pppoe-server rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned udisks2 upower wpa_supplicant@
indirect	pcscd saned@ wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=e710f57a-f290-46a0-a58f-3ef44ale3f08
splash=silent

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Platform Notes (Continued)

```
mitigations=auto
quiet
security=apparmor
```

```
-----
14. cpupower frequency-info
analyzing CPU 0:
  current policy: frequency should be within 1.50 GHz and 3.55 GHz.
                  The governor "performance" may decide which speed to use
                  within this range.
  boost state support:
    Supported: yes
    Active: yes
```

```
-----
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+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
```

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CPU2017 License: 3

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Software Availability: Apr-2023

Platform Notes (Continued)

os-release SUSE Linux Enterprise Server 15 SP4

20. Disk information

SPEC is set to: /home/cpu2k17

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	btrfs	445G	247G	198G	56%	/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 3.2 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:

8x Samsung M321R4GA3BB0-CQKDG 32 GB 2 rank 4800
 16x Samsung M321R4GA3BB6-CQKDG 32 GB 2 rank 4800

23. BIOS

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

BIOS Vendor: HPE
 BIOS Version: 1.50
 BIOS Date: 10/04/2023
 BIOS Revision: 1.50
 Firmware Revision: 1.50

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 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++   | 620.omnetpp_s(base, peak) 623.xalancbnk_s(base, peak) 631.deepsjeng_s(base, peak)  

      | 641.leela_s(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 | 648.exchange2_s(base, peak)  

=====
```

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Compiler Version Notes (Continued)

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

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

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 -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lflang
-lamdalloc

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Base Optimization Flags (Continued)

C++ benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -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,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver4 -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

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang



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Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-fstruct-layout=9 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

```
602.gcc_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -z muldefs -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

605.mcf_s: Same as 600.perlbench_s

625.x264_s: Same as 600.perlbench_s

657.xz_s: Same as 600.perlbench_s

C++ benchmarks:

```
620.omnetpp_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang
```

```
623.xalancbmk_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

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Peak Optimization Flags (Continued)

623.xalancbmk_s (continued):

```
-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang
```

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

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
```

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Genoa-X-rev1.5.html>

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

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Genoa-X-rev1.5.xml>

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

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