



SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_fp_base = 1520

SPECrate®2017_fp_peak = 1620

CPU2017 License: 3

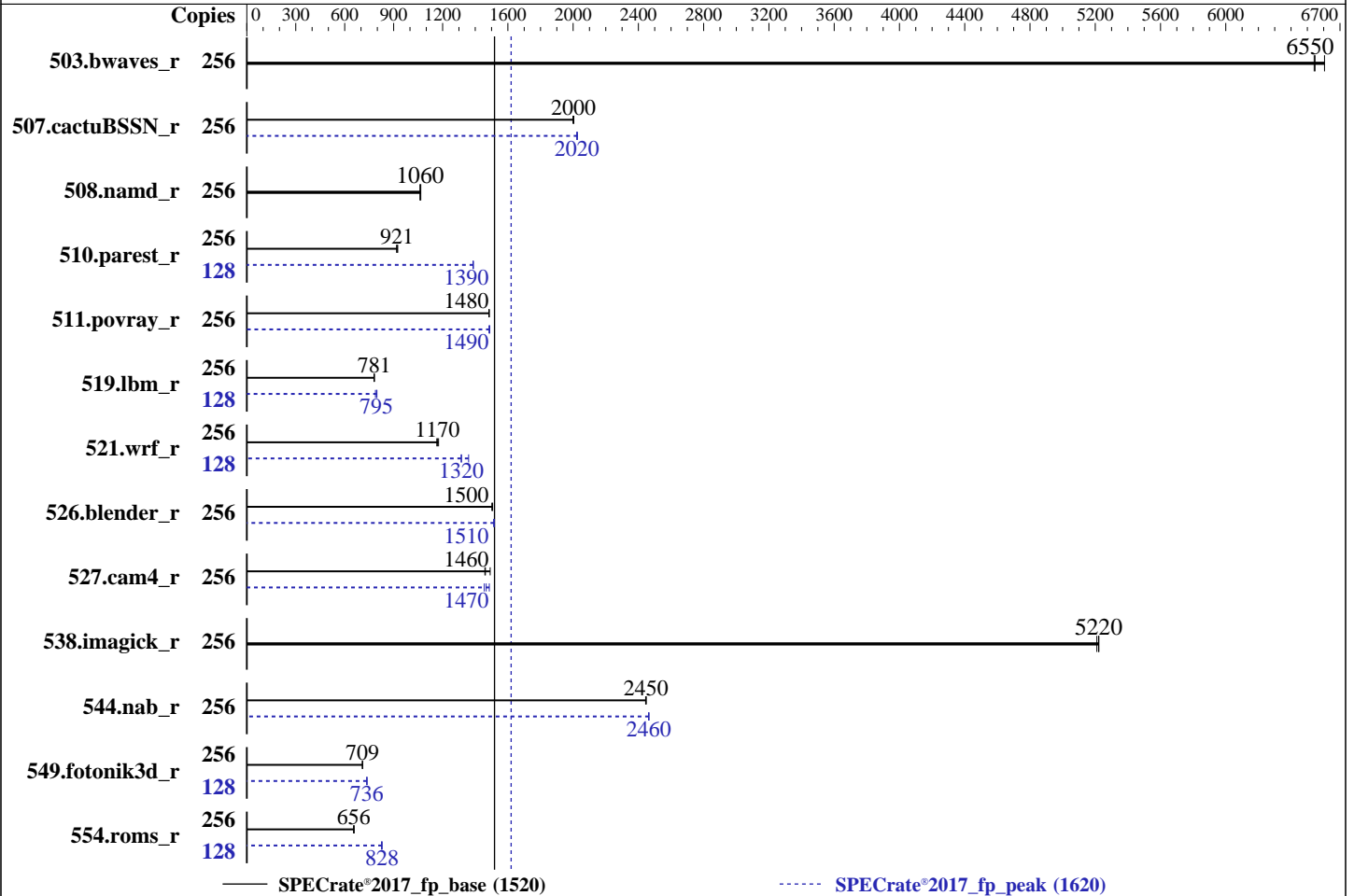
Test Sponsor: HPE

Tested by: HPE

Test Date: Nov-2024

Hardware Availability: Jan-2025

Software Availability: Sep-2024



Hardware

CPU Name: AMD EPYC 9535
 Max MHz: 4300
 Nominal: 2400
 Enabled: 128 cores, 2 chips, 2 threads/core
 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,
 16 MB shared / 4 cores
 Other: None
 Memory: 768 GB (24 x 32 GB 2Rx8 PC5-6400B-R,
 running at 6000)
 Storage: 1 x 960 GB SATA 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 v2.20 10/31/2024 released
 Oct-2024
 File System: xfs
 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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	256	389	6610	<u>392</u>	<u>6550</u>	392	6540	256	389	6610	<u>392</u>	<u>6550</u>	392	6540
507.cactuBSSN_r	256	162	2000	<u>162</u>	<u>2000</u>	162	2000	256	<u>160</u>	<u>2020</u>	160	2020	160	2030
508.namd_r	256	<u>229</u>	<u>1060</u>	228	1070	229	1060	256	<u>229</u>	<u>1060</u>	228	1070	229	1060
510.parest_r	256	724	925	<u>727</u>	<u>921</u>	730	918	128	241	1390	<u>241</u>	<u>1390</u>	241	1390
511.povray_r	256	<u>403</u>	<u>1480</u>	402	1490	403	1480	256	<u>402</u>	<u>1490</u>	403	1480	401	1490
519.lbm_r	256	346	779	<u>345</u>	<u>781</u>	345	782	128	<u>170</u>	<u>795</u>	171	788	169	797
521.wrf_r	256	488	1180	<u>490</u>	<u>1170</u>	493	1160	128	<u>218</u>	<u>1320</u>	211	1360	218	1310
526.blender_r	256	259	1500	259	1510	<u>259</u>	<u>1500</u>	256	<u>257</u>	<u>1510</u>	257	1520	258	1510
527.cam4_r	256	300	1490	307	1460	<u>306</u>	<u>1460</u>	256	308	1460	301	1490	<u>305</u>	<u>1470</u>
538.imagick_r	256	<u>122</u>	<u>5220</u>	122	5220	122	5210	256	<u>122</u>	<u>5220</u>	122	5220	122	5210
544.nab_r	256	176	2440	<u>176</u>	<u>2450</u>	176	2450	256	<u>175</u>	<u>2460</u>	175	2460	175	2460
549.fotonik3d_r	256	<u>1407</u>	<u>709</u>	1409	708	1406	710	128	678	736	<u>678</u>	<u>736</u>	678	736
554.roms_r	256	<u>620</u>	<u>656</u>	619	657	621	655	128	<u>246</u>	<u>828</u>	246	826	246	828

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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,

(Continued on next page)



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Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

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 Configuration

Workload Profile set to General Throughput 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

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

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

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.localdomain Sun Nov 24 18:52:56 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

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Platform Notes (Continued)

```

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.localdomain 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
18:52:56 up 1 min, 3 users, load average: 11.25, 8.01, 3.20
USER      TTY      FROM          LOGIN@      IDLE        JCPU        PCPU WHAT
root      :          :             18:52      ?xdm?      32:36      0.01s gdm-session-worker [pam/gdm-password]
root      seat0    login-        18:52      0.00s      0.00s      0.00s /usr/lib/gdm/gdm-x-session
--register-session --run-script gnome
root      :1       :             18:52      ?xdm?      32:36      0.00s /usr/lib/gdm/gdm-x-session
--register-session --run-script gnome
root      pts/1    172.17.1.96   18:52      16.00s     1.02s     0.18s /bin/bash ./amd_rate_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) 3094135
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) 3094135
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

```

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Platform Notes (Continued)

```

sshd: root [priv]
sshd: root@pts/1
-bash
python3 ./run_fprate.py
/bin/bash ./amd_rate_aocc500_znver5_A1.sh
runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 fprate
runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.012/templogs/preenv.fprate.012.0.log --lognum 012.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$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      : 0xb00211a
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 192 4K pages
cpu cores     : 64
siblings      : 128
2 physical ids (chips)
256 processors (hardware threads)
physical id 0: core ids
0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59,64-67,72-75,80-83,88-91,96-99,104-107,112-115,120-123
physical id 1: core ids
0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59,64-67,72-75,80-83,88-91,96-99,104-107,112-115,120-123
physical id 0: apicids
0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
240-247
physical id 1: apicids
256-263,272-279,288-295,304-311,320-327,336-343,352-359,368-375,384-391,400-407,416-423,432-439,448-455,4
64-471,480-487,496-503
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):                256
On-line CPU(s) list:  0-255
Vendor ID:             AuthenticAMD
BIOS Vendor ID:       Advanced Micro Devices, Inc.
Model name:            AMD EPYC 9535 64-Core Processor
BIOS Model name:      AMD EPYC 9535 64-Core Processor
BIOS CPU family:      107
CPU family:            26
Model:                 2
Thread(s) per core:   2
Core(s) per socket:   64
Socket(s):             2
Stepping:              1

```

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Platform Notes (Continued)

```

Frequency boost:          enabled
CPU(s) scaling MHz:      102%
CPU max MHz:              2400.0000
CPU min MHz:              1500.0000
BogoMIPS:                 4792.50
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 pcid
                           sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm
                           cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
                           osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
                           perfctr_llc mwaitx cpb cat_l3 cdp_l3 hw_pstate ssbd mba perfmon_v2
                           ibrs ibpb stibp ibrs_enhanced vmmcall fsgsbase tsc_adjust bmil avx2
                           smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                           avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                           xsaves 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

Virtualization:           AMD-V
L1d cache:                6 MiB (128 instances)
L1i cache:                4 MiB (128 instances)
L2 cache:                 128 MiB (128 instances)
L3 cache:                 512 MiB (32 instances)
NUMA node(s):            32
NUMA node0 CPU(s):       0-3,128-131
NUMA node1 CPU(s):       4-7,132-135
NUMA node2 CPU(s):       8-11,136-139
NUMA node3 CPU(s):       12-15,140-143
NUMA node4 CPU(s):       16-19,144-147
NUMA node5 CPU(s):       20-23,148-151
NUMA node6 CPU(s):       24-27,152-155
NUMA node7 CPU(s):       28-31,156-159
NUMA node8 CPU(s):       32-35,160-163
NUMA node9 CPU(s):       36-39,164-167
NUMA node10 CPU(s):      40-43,168-171
NUMA node11 CPU(s):      44-47,172-175
NUMA node12 CPU(s):      48-51,176-179
NUMA node13 CPU(s):      52-55,180-183
NUMA node14 CPU(s):      56-59,184-187
NUMA node15 CPU(s):      60-63,188-191
NUMA node16 CPU(s):      64-67,192-195
NUMA node17 CPU(s):      68-71,196-199
NUMA node18 CPU(s):      72-75,200-203
NUMA node19 CPU(s):      76-79,204-207
NUMA node20 CPU(s):      80-83,208-211
NUMA node21 CPU(s):      84-87,212-215
NUMA node22 CPU(s):      88-91,216-219
NUMA node23 CPU(s):      92-95,220-223
NUMA node24 CPU(s):      96-99,224-227
NUMA node25 CPU(s):      100-103,228-231
NUMA node26 CPU(s):      104-107,232-235
NUMA node27 CPU(s):      108-111,236-239
NUMA node28 CPU(s):      112-115,240-243

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Platform Notes (Continued)

```

NUMA node29 CPU(s):          116-119,244-247
NUMA node30 CPU(s):          120-123,248-251
NUMA node31 CPU(s):          124-127,252-255
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:   Not affected
Vulnerability Lltf:           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
                               always-on; RSB filling; PBR SB-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	6M	12	Data	1	64	1	64
L1i	32K	4M	8	Instruction	1	64	1	64
L2	1M	128M	16	Unified	2	1024	1	64
L3	16M	512M	16	Unified	3	16384	1	64

8. numactl --hardware

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

```

available: 32 nodes (0-31)
node 0 cpus: 0-3,128-131
node 0 size: 23872 MB
node 0 free: 23671 MB
node 1 cpus: 4-7,132-135
node 1 size: 24189 MB
node 1 free: 24011 MB
node 2 cpus: 8-11,136-139
node 2 size: 24189 MB
node 2 free: 23998 MB
node 3 cpus: 12-15,140-143
node 3 size: 24189 MB
node 3 free: 23987 MB
node 4 cpus: 16-19,144-147
node 4 size: 24189 MB
node 4 free: 23883 MB
node 5 cpus: 20-23,148-151
node 5 size: 24189 MB
node 5 free: 23915 MB
node 6 cpus: 24-27,152-155
node 6 size: 24189 MB
node 6 free: 23897 MB
node 7 cpus: 28-31,156-159
node 7 size: 24189 MB
node 7 free: 23869 MB
node 8 cpus: 32-35,160-163
node 8 size: 24189 MB
node 8 free: 23648 MB
node 9 cpus: 36-39,164-167
node 9 size: 24189 MB
node 9 free: 24016 MB

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Platform Notes (Continued)

```

node 10 cpus: 40-43,168-171
node 10 size: 24189 MB
node 10 free: 24022 MB
node 11 cpus: 44-47,172-175
node 11 size: 24189 MB
node 11 free: 23954 MB
node 12 cpus: 48-51,176-179
node 12 size: 24189 MB
node 12 free: 23629 MB
node 13 cpus: 52-55,180-183
node 13 size: 24189 MB
node 13 free: 24020 MB
node 14 cpus: 56-59,184-187
node 14 size: 24189 MB
node 14 free: 24027 MB
node 15 cpus: 60-63,188-191
node 15 size: 24189 MB
node 15 free: 24017 MB
node 16 cpus: 64-67,192-195
node 16 size: 24189 MB
node 16 free: 24041 MB
node 17 cpus: 68-71,196-199
node 17 size: 24189 MB
node 17 free: 23941 MB
node 18 cpus: 72-75,200-203
node 18 size: 24189 MB
node 18 free: 24047 MB
node 19 cpus: 76-79,204-207
node 19 size: 24189 MB
node 19 free: 24048 MB
node 20 cpus: 80-83,208-211
node 20 size: 24151 MB
node 20 free: 23877 MB
node 21 cpus: 84-87,212-215
node 21 size: 24189 MB
node 21 free: 24023 MB
node 22 cpus: 88-91,216-219
node 22 size: 24189 MB
node 22 free: 24051 MB
node 23 cpus: 92-95,220-223
node 23 size: 24189 MB
node 23 free: 24044 MB
node 24 cpus: 96-99,224-227
node 24 size: 24189 MB
node 24 free: 24035 MB
node 25 cpus: 100-103,228-231
node 25 size: 24189 MB
node 25 free: 24051 MB
node 26 cpus: 104-107,232-235
node 26 size: 24189 MB
node 26 free: 24054 MB
node 27 cpus: 108-111,236-239
node 27 size: 24189 MB
node 27 free: 23976 MB
node 28 cpus: 112-115,240-243
node 28 size: 24189 MB
node 28 free: 24050 MB
node 29 cpus: 116-119,244-247
node 29 size: 24189 MB
node 29 free: 24060 MB

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Test Sponsor: HPE
Tested by: HPE

Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Sep-2024

Platform Notes (Continued)

node 30 cpus: 120-123,248-251
node 30 size: 24189 MB
node 30 free: 24051 MB
node 31 cpus: 124-127,252-255
node 31 size: 24037 MB
node 31 free: 23832 MB
node distances:

node	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31																			
0:	10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
1:	11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
2:	11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
3:	11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
4:	12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
5:	12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
6:	12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
7:	12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
8:	12	12	12	12	12	12	12	12	10	11	11	11	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
9:	12	12	12	12	12	12	12	12	11	10	11	11	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
10:	12	12	12	12	12	12	12	12	11	11	10	11	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
11:	12	12	12	12	12	12	12	12	11	11	11	10	12	12	12	12	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
12:	12	12	12	12	12	12	12	12	12	12	12	10	11	11	11	11	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
13:	12	12	12	12	12	12	12	12	12	12	12	11	10	11	11	11	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
14:	12	12	12	12	12	12	12	12	12	12	12	11	11	10	11	11	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
15:	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	11	32	32	32	32	32	32	32	32	32
32	32	32	32	32	32	32																			
16:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	10	11	11	11	12	12	12	12	12
12	12	12	12	12	12	12																			
17:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	10	11	11	12	12	12	12	12
12	12	12	12	12	12	12																			
18:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	10	11	12	12	12	12	12
12	12	12	12	12	12	12																			
19:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	10	12	12	12	12	12
12	12	12	12	12	12	12																			
20:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	10	11	11	11	12
12	12	12	12	12	12	12																			
21:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	11	10	11	11	12
12	12	12	12	12	12	12																			
22:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	11	11	10	11	12
12	12	12	12	12	12	12																			
23:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	11	11	11	10	12
12	12	12	12	12	12	12																			
24:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	12	12	10
11	11	11	12	12	12	12																			
25:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	12	12	11

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_fp_base = 1520

SPECrate®2017_fp_peak = 1620

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

Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Sep-2024

Platform Notes (Continued)

```

10 11 11 12 12 12 12
26: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 11
11 10 11 12 12 12 12
27: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 11
11 11 10 12 12 12 12
28: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 10 11 11 11
29: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 11 10 11 11
30: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 11 11 10 11
31: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 11 11 11 10

```

```

-----
9. /proc/meminfo
   MemTotal:          792130008 kB

```

```

-----
10. who -r
    run-level 5 Nov 24 18:52

```

```

-----
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
    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 ipmievdev
                    issue-add-ssh-keys kexec-load lunmask 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-sysext 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=03804bb9-43a7-4bf1-b551-5c912b239e58
    splash=silent
    mitigations=auto
    quiet
    security=apparmor

```

```

-----
14. cpupower frequency-info
    analyzing CPU 65:
        current policy: frequency should be within 1.50 GHz and 2.40 GHz.
                        The governor "performance" may decide which speed to use

```

(Continued on next page)



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Software Availability: Sep-2024

Platform Notes (Continued)

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
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/sdd2 xfs 892G 47G 845G 6% /

(Continued on next page)



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Software Availability: Sep-2024

Platform Notes (Continued)

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

Vendor: HPE
Product: ProLiant DL385 Gen11
Product Family: ProLiant
Serial: DL385GEN11-001

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 HMC88AHBRA472N 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 | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_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++ | 508.namd_r(base, peak) 510.parest_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++, C | 511.povray_r(base, peak) 526.blender_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
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
=====

(Continued on next page)



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ProLiant DL385 Gen11

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_fp_base = 1520

SPECrate®2017_fp_peak = 1620

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)

C++, C, Fortran | 507.cactuBSSN_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
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
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 | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_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, C | 521.wrf_r(base, peak) 527.cam4_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
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

Benchmarks using both Fortran and C:

flang clang

Benchmarks using both C and C++:

clang++ clang

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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ProLiant DL385 Gen11

(2.40 GHz, AMD EPYC 9535)

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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

Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Base Portability Flags

```

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_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 -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 -lamdalloc
-lflang -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,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl

```

(Continued on next page)



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ProLiant DL385 Gen11

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_fp_base = 1520

SPECrate®2017_fp_peak = 1620

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

Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Sep-2024

Base Optimization Flags (Continued)

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

Benchmarks using both Fortran and C:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -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 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Benchmarks using both C and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-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 -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
-ldl
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-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 -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```



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Software Availability: Sep-2024

Base Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-unused-command-line-argument

Benchmarks using both C and C++:

-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-unused-command-line-argument

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags



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Tested by: HPE

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Hardware Availability: Jan-2025

Software Availability: Sep-2024

Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fltto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

538.imagick_r: basepeak = yes

```
544.nab_r: -m64 -fltto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

C++ benchmarks:

508.namd_r: basepeak = yes

```
510.parest_r: -m64 -std=c++14 -fltto -Wl,-mllvm -Wl,-suppress-fmas
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

Fortran benchmarks:

503.bwaves_r: basepeak = yes

```
549.fotonik3d_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fltto
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lamdalloc -ldl -lflang
```

```
554.roms_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fltto
```

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ProLiant DL385 Gen11

(2.40 GHz, AMD EPYC 9535)

SPECrate®2017_fp_base = 1520

SPECrate®2017_fp_peak = 1620

CPU2017 License: 3

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Peak Optimization Flags (Continued)

554.roms_r (continued):

```
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lamdalloc -ldl -lflang
```

Benchmarks using both Fortran and C:

```
521.wrf_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang
```

```
527.cam4_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -freemap-arrays
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang
```

Benchmarks using both C and C++:

```
511.povray_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc -ldl
```

```
526.blender_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

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Peak Optimization Flags (Continued)

526.blender_r (continued):

```
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -lamdlibm -lamdalloc -ldl
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-faggressive-loop-transform -fvector-transform -fscalar-transform
-Mrecursive -fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang
```

Peak Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-unused-command-line-argument

Benchmarks using both C and C++:

-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-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/aocc500-flags.html>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.0.html>

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

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.0.xml>

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