SPEC CPU®2017 Floating Point Rate Result

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Supermicro
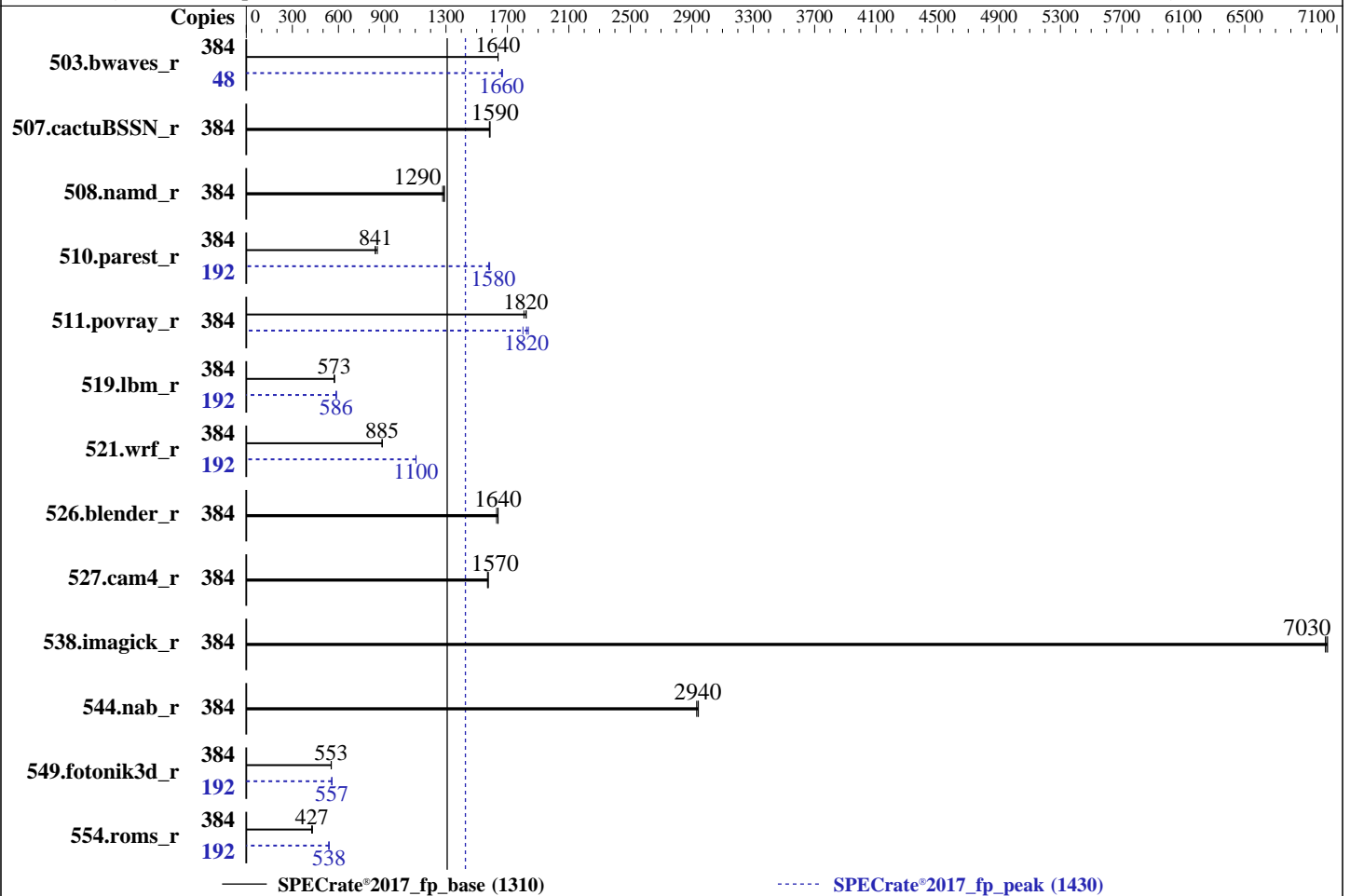
A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

$SPECrate^{®}2017\_fp\_base = 1310$

$SPECrate^{®}2017\_fp\_peak = 1430$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2022

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Benchmark	Copies	Base	Peak
503.bwaves_r	384 / 48	1640	1660
507.cactuBSSN_r	384	1590	
508.namd_r	384	1290	
510.parest_r	384 / 192	841	1580
511.povray_r	384	1820	1820
519.lbm_r	384 / 192	573	586
521.wrf_r	384 / 192	885	1100
526.blender_r	384	1640	
527.cam4_r	384	1570	
538.imagick_r	384	7030	
544.nab_r	384	2940	
549.fotonik3d_r	384 / 192	553	557
554.roms_r	384 / 192	427	538

SPECrate®2017_fp_base (1310)   SPECrate®2017_fp_peak (1430)

Hardware

CPU Name: AMD EPYC 9654
 Max MHz: 3700
 Nominal: 2400
Enabled: 192 cores, 2 chips, 2 threads/core
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: 384 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
Memory: 3 TB (24 x 128 GB 2Rx4 PC5-4800B-R)
Storage: 1.5 TB on tmpfs
Other: None

Software

OS: Ubuntu 22.04.1 LTS
  Kernel 5.15.0-52-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 0.10 released Oct-2022
File System: tmpfs
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	384	2350	1640	2349	1640	**2349**	**1640**	48	**289**	**1660**	289	1670	290	1660
507.cactuBSSN_r	384	**307**	**1590**	306	1590	307	1580	384	**307**	**1590**	306	1590	307	1580
508.namd_r	384	283	1290	285	1280	**283**	**1290**	384	283	1290	285	1280	**283**	**1290**
510.parest_r	384	**1194**	**841**	1177	854	1196	840	192	318	1580	**318**	**1580**	317	1580
511.povray_r	384	**492**	**1820**	496	1810	492	1820	384	488	1840	**491**	**1820**	498	1800
519.lbm_r	384	706	573	705	574	**706**	**573**	192	345	586	**345**	**586**	346	585
521.wrf_r	384	**972**	**885**	973	884	971	886	192	389	1110	389	1100	**389**	**1100**
526.blender_r	384	359	1630	**357**	**1640**	357	1640	384	359	1630	**357**	**1640**	357	1640
527.cam4_r	384	426	1580	**427**	**1570**	428	1570	384	426	1580	**427**	**1570**	428	1570
538.imagick_r	384	136	7040	**136**	**7030**	136	7020	384	136	7040	**136**	**7030**	136	7020
544.nab_r	384	**220**	**2940**	220	2930	220	2940	384	**220**	**2940**	220	2930	220	2940
549.fotonik3d_r	384	**2706**	**553**	2709	552	2702	554	192	1343	557	**1343**	**557**	1344	557
554.roms_r	384	1432	426	1416	431	**1428**	**427**	192	568	537	565	540	**567**	**538**
SPECrate®2017_fp_base =	**1310**												
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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.

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Operating System Notes (Continued)

```
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.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
      "/dev/shm/amd_rate_aocc400_genoa_B_lib/lib:/dev/shm/amd_rate_aocc400_gen
      oa_B_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 Settings:
Determinism Control = Manual
Determinism Enable = Disable Performance Determinism
cTDP Control = Manual
cTDP = 400
Package Power Limit Control = Manual
Package Power Limit = 400
ACPI SRAT L3 cache As NUMA Domain = Enabled

 Sysinfo program /dev/shm/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on sysv Mon Oct 24 00:25:25 2022
```

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Platform Notes (Continued)

```
SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : AMD EPYC 9654 96-Core Processor
      2  "physical id"s (chips)
      384 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The following
   excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
      cpu cores : 96
      siblings  : 192
      physical 0: cores 0 1 2 3 4 5 6 7 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
      26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
      54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
      82 83 84 85 86 87 88 89 90 91 92 93 94 95
      physical 1: cores 0 1 2 3 4 5 6 7 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
      26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
      54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
      82 83 84 85 86 87 88 89 90 91 92 93 94 95


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
      Byte Order:                Little Endian
      CPU(s):                    384
      On-line CPU(s) list:       0-383
      Vendor ID:                 AuthenticAMD
      Model name:                AMD EPYC 9654 96-Core Processor
      CPU family:                25
      Model:                     17
      Thread(s) per core:        2
      Core(s) per socket:        96
      Socket(s):                 2
      Stepping:                  1
      Frequency boost:           enabled
      CPU max MHz:               3709.0000
      CPU min MHz:               400.0000
      BogoMIPS:                  4799.88
      Flags:                     fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
      pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt
      pdpe1gb rdtscp lm constant_tsc rep_good 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 invpcid_single hw_pstate ssbd mba ibrs
```

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Platform Notes (Continued)

```
    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
    avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
    cqm_mbm_local 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 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
  Virtualization:                 AMD-V
  L1d cache:                      6 MiB (192 instances)
  L1i cache:                      6 MiB (192 instances)
  L2 cache:                       192 MiB (192 instances)
  L3 cache:                       768 MiB (24 instances)
  NUMA node(s):                   24
  NUMA node0 CPU(s):              0-7,192-199
  NUMA node1 CPU(s):              8-15,200-207
  NUMA node2 CPU(s):              16-23,208-215
  NUMA node3 CPU(s):              24-31,216-223
  NUMA node4 CPU(s):              32-39,224-231
  NUMA node5 CPU(s):              40-47,232-239
  NUMA node6 CPU(s):              48-55,240-247
  NUMA node7 CPU(s):              56-63,248-255
  NUMA node8 CPU(s):              64-71,256-263
  NUMA node9 CPU(s):              72-79,264-271
  NUMA node10 CPU(s):             80-87,272-279
  NUMA node11 CPU(s):             88-95,280-287
  NUMA node12 CPU(s):             96-103,288-295
  NUMA node13 CPU(s):             104-111,296-303
  NUMA node14 CPU(s):             112-119,304-311
  NUMA node15 CPU(s):             120-127,312-319
  NUMA node16 CPU(s):             128-135,320-327
  NUMA node17 CPU(s):             136-143,328-335
  NUMA node18 CPU(s):             144-151,336-343
  NUMA node19 CPU(s):             152-159,344-351
  NUMA node20 CPU(s):             160-167,352-359
  NUMA node21 CPU(s):             168-175,360-367
  NUMA node22 CPU(s):             176-183,368-375
  NUMA node23 CPU(s):             184-191,376-383
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         Not affected
  Vulnerability Mmio stale data:  Not affected
  Vulnerability Retbleed:         Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
    prctl and seccomp
  Vulnerability Spectre v1:        Mitigation; usercopy/swapgs barriers and __user
```

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Platform Notes (Continued)

```
      pointer sanitization
      Vulnerability Spectre v2:        Mitigation; Retpolines, IBPB conditional, IBRS_FW,
      STIBP always-on, RSB filling, PBRSB-eIBRS Not affected
      Vulnerability Srbds:            Not affected
      Vulnerability Tsx async abort:   Not affected

 From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL   SETS PHY-LINE COHERENCY-SIZE
      L1d       32K       6M   8 Data            1     64        1              64
      L1i       32K       6M   8 Instruction     1     64        1              64
      L2         1M     192M   8 Unified         2   2048        1              64
      L3        32M     768M  16 Unified         3  32768        1              64

 /proc/cpuinfo cache data
    cache size : 1024 KB


 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 24 nodes (0-23)
   node 0 cpus: 0 1 2 3 4 5 6 7 192 193 194 195 196 197 198 199
   node 0 size: 128752 MB
   node 0 free: 127645 MB
   node 1 cpus: 8 9 10 11 12 13 14 15 200 201 202 203 204 205 206 207
   node 1 size: 129018 MB
   node 1 free: 128034 MB
   node 2 cpus: 16 17 18 19 20 21 22 23 208 209 210 211 212 213 214 215
   node 2 size: 129018 MB
   node 2 free: 128071 MB
   node 3 cpus: 24 25 26 27 28 29 30 31 216 217 218 219 220 221 222 223
   node 3 size: 128983 MB
   node 3 free: 128056 MB
   node 4 cpus: 32 33 34 35 36 37 38 39 224 225 226 227 228 229 230 231
   node 4 size: 129018 MB
   node 4 free: 128082 MB
   node 5 cpus: 40 41 42 43 44 45 46 47 232 233 234 235 236 237 238 239
   node 5 size: 129018 MB
   node 5 free: 128072 MB
   node 6 cpus: 48 49 50 51 52 53 54 55 240 241 242 243 244 245 246 247
   node 6 size: 129018 MB
   node 6 free: 128064 MB
   node 7 cpus: 56 57 58 59 60 61 62 63 248 249 250 251 252 253 254 255
   node 7 size: 129018 MB
   node 7 free: 128075 MB
   node 8 cpus: 64 65 66 67 68 69 70 71 256 257 258 259 260 261 262 263
   node 8 size: 129018 MB
   node 8 free: 128016 MB
   node 9 cpus: 72 73 74 75 76 77 78 79 264 265 266 267 268 269 270 271
```

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Platform Notes (Continued)

```
     node 9 size: 129018 MB
     node 9 free: 123202 MB
     node 10 cpus: 80 81 82 83 84 85 86 87 272 273 274 275 276 277 278 279
     node 10 size: 129018 MB
     node 10 free: 128061 MB
     node 11 cpus: 88 89 90 91 92 93 94 95 280 281 282 283 284 285 286 287
     node 11 size: 129018 MB
     node 11 free: 128116 MB
     node 12 cpus: 96 97 98 99 100 101 102 103 288 289 290 291 292 293 294 295
     node 12 size: 129018 MB
     node 12 free: 127943 MB
     node 13 cpus: 104 105 106 107 108 109 110 111 296 297 298 299 300 301 302 303
     node 13 size: 129018 MB
     node 13 free: 128113 MB
     node 14 cpus: 112 113 114 115 116 117 118 119 304 305 306 307 308 309 310 311
     node 14 size: 129018 MB
     node 14 free: 128097 MB
     node 15 cpus: 120 121 122 123 124 125 126 127 312 313 314 315 316 317 318 319
     node 15 size: 129018 MB
     node 15 free: 128102 MB
     node 16 cpus: 128 129 130 131 132 133 134 135 320 321 322 323 324 325 326 327
     node 16 size: 129018 MB
     node 16 free: 128096 MB
     node 17 cpus: 136 137 138 139 140 141 142 143 328 329 330 331 332 333 334 335
     node 17 size: 129018 MB
     node 17 free: 128104 MB
     node 18 cpus: 144 145 146 147 148 149 150 151 336 337 338 339 340 341 342 343
     node 18 size: 129018 MB
     node 18 free: 127724 MB
     node 19 cpus: 152 153 154 155 156 157 158 159 344 345 346 347 348 349 350 351
     node 19 size: 129018 MB
     node 19 free: 128084 MB
     node 20 cpus: 160 161 162 163 164 165 166 167 352 353 354 355 356 357 358 359
     node 20 size: 128951 MB
     node 20 free: 128031 MB
     node 21 cpus: 168 169 170 171 172 173 174 175 360 361 362 363 364 365 366 367
     node 21 size: 129018 MB
     node 21 free: 128076 MB
     node 22 cpus: 176 177 178 179 180 181 182 183 368 369 370 371 372 373 374 375
     node 22 size: 129018 MB
     node 22 free: 128101 MB
     node 23 cpus: 184 185 186 187 188 189 190 191 376 377 378 379 380 381 382 383
     node 23 size: 129018 MB
     node 23 free: 128098 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
```

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Platform Notes (Continued)

```
 0:   10   11   11   11   11   11   11   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 1:   11   10   11   11   11   11   11   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 2:   11   11   10   11   11   11   11   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 3:   11   11   11   10   11   11   11   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 4:   11   11   11   11   10   11   11   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 5:   11   11   11   11   11   10   11   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 6:   11   11   11   11   11   11   10   11   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 7:   11   11   11   11   11   11   11   10   11   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 8:   11   11   11   11   11   11   11   11   10   11   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
 9:   11   11   11   11   11   11   11   11   11   10   11   11   32   32   32   32   32   32   32   32
     32   32   32   32
10:   11   11   11   11   11   11   11   11   11   11   10   11   32   32   32   32   32   32   32   32
     32   32   32   32
11:   11   11   11   11   11   11   11   11   11   11   11   10   32   32   32   32   32   32   32   32
     32   32   32   32
12:   32   32   32   32   32   32   32   32   32   32   32   32   10   11   11   11   11   11   11   11
     11   11   11   11
13:   32   32   32   32   32   32   32   32   32   32   32   32   11   10   11   11   11   11   11   11
     11   11   11   11
14:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   10   11   11   11   11   11
     11   11   11   11
15:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   10   11   11   11   11
     11   11   11   11
16:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   10   11   11   11
     11   11   11   11
17:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   10   11   11
     11   11   11   11
18:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   11   10   11
     11   11   11   11
19:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   11   11   10
     11   11   11   11
20:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   11   11   11
     10   11   11   11
21:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   11   11   11
     11   10   11   11
22:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   11   11   11
     11   11   10   11
23:   32   32   32   32   32   32   32   32   32   32   32   32   11   11   11   11   11   11   11   11
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Platform Notes (Continued)

```
    11  11  11  10

 From /proc/meminfo
    MemTotal:       3170387988 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
    performance

 /usr/bin/lsb_release -d
    Ubuntu 22.04.1 LTS

 From /etc/*release* /etc/*version*
    debian_version: bookworm/sid
    os-release:
       PRETTY_NAME="Ubuntu 22.04.1 LTS"
       NAME="Ubuntu"
       VERSION_ID="22.04"
       VERSION="22.04.1 LTS (Jammy Jellyfish)"
       VERSION_CODENAME=jammy
       ID=ubuntu
       ID_LIKE=debian
       HOME_URL="https://www.ubuntu.com/"

 uname -a:
    Linux sysv 5.15.0-52-generic #58-Ubuntu SMP Thu Oct 13 08:03:55 UTC 2022 x86_64 x86_64
    x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2018-12207 (iTLB Multihit):              Not affected
 CVE-2018-3620 (L1 Terminal Fault):           Not affected
 Microarchitectural Data Sampling:            Not affected
 CVE-2017-5754 (Meltdown):                    Not affected
 mmio_stale_data:                             Not affected
 retbleed:                                    Not affected
 CVE-2018-3639 (Speculative Store Bypass):    Mitigation: Speculative Store
                                              Bypass disabled via prctl and
                                              seccomp
 CVE-2017-5753 (Spectre variant 1):           Mitigation: usercopy/swapgs
                                              barriers and __user pointer
                                              sanitization
 CVE-2017-5715 (Spectre variant 2):           Mitigation: Retpolines, IBPB:
                                              conditional, IBRS_FW, STIBP:
                                              always-on, RSB filling,
                                              PBRSB-eIBRS: Not affected
```

(Continued on next page)

Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2022

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Platform Notes (Continued)

```
 CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
 CVE-2019-11135 (TSX Asynchronous Abort):               Not affected

 run-level 5 Oct 23 17:54

 SPEC is set to: /dev/shm
    Filesystem      Type  Size  Used Avail Use% Mounted on
    tmpfs           tmpfs 1.5T  4.8G  1.5T   1% /dev/shm

 From /sys/devices/virtual/dmi/id
    Vendor:          Supermicro
    Product:         Super Server
    Product Family:  SMC H13
    Serial:          123456789

 Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you
 interpret this section. The 'dmidecode' program reads system data which is "intended to
 allow hardware to be accurately determined", but the intent may not be met, as there are
 frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
    Memory:
       24x SK Hynix HMCT04MEERA135N 128 GB 2 rank 4800

 BIOS:
    BIOS Vendor:        American Megatrends International, LLC.
    BIOS Version:       0.10
    BIOS Date:          10/18/2022
    BIOS Revision:      5.27

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C              | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
               | 544.nab_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
C++            | 508.namd_r(base, peak) 510.parest_r(base, peak)
------------------------------------------------------------------------------
```

(Continued on next page)

Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

CPU2017 License: 001176

Test Sponsor: Supermicro

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Test Date: Oct-2022

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Compiler Version Notes (Continued)

```
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
C++, C            | 511.povray_r(base, peak) 526.blender_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
Fortran           | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                  | 554.roms_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
```

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Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

Compiler Version Notes (Continued)

```
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------


==============================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

SPEC CPU®2017 Floating Point Rate Result

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Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

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

Test Date: Oct-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022

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 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -lamdlibm -lamdalloc -lflang
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

(Continued on next page)

Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

CPU2017 License: 001176	**Test Date:** Oct-2022
Test Sponsor: Supermicro	**Hardware Availability:** Nov-2022
Tested by: Supermicro	**Software Availability:** Nov-2022

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Benchmarks using both C and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Base Other Flags

C benchmarks:
```
-Wno-unused-command-line-argument
```

C++ benchmarks:
```
-Wno-unused-command-line-argument
```

Fortran benchmarks:
```
-Wno-unused-command-line-argument
```

Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

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

Test Date: Oct-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Base Other Flags (Continued)

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`

Peak Optimization Flags

C benchmarks:

`519.lbm_r:` `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`

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Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

CPU2017 License: 001176	**Test Date:**	Oct-2022
Test Sponsor: Supermicro	**Hardware Availability:**	Nov-2022
Tested by: Supermicro	**Software Availability:**	Nov-2022

Peak Optimization Flags (Continued)

519.lbm_r (continued):
```
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc
```

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: ```-m64 -flto -Wl,-mllvm -Wl,-suppress-fmas
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc```

Fortran benchmarks:

503.bwaves_r: ```-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lamdalloc -lflang```

549.fotonik3d_r: ```-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Kieee
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lamdalloc -lflang```

554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: ```-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3```

(Continued on next page)

Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

SPECrate®2017_fp_base = 1310

SPECrate®2017_fp_peak = 1430

Peak Optimization Flags (Continued)

521.wrf_r (continued):
```
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc
```

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

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
```

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Supermicro

A+ Server 2025HS-TNR
(H13DSH , AMD EPYC 9654)

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

Test Date: Oct-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Peak Other Flags (Continued)

Benchmarks using both C and C++:
`-Wno-unused-command-line-argument`

Benchmarks using Fortran, C, and C++:
`-Wno-unused-command-line-argument`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/aocc400-flags.html`
`http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc400-flags.xml`
`http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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