SPEC CPU®2017 Integer Rate Result

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Supermicro
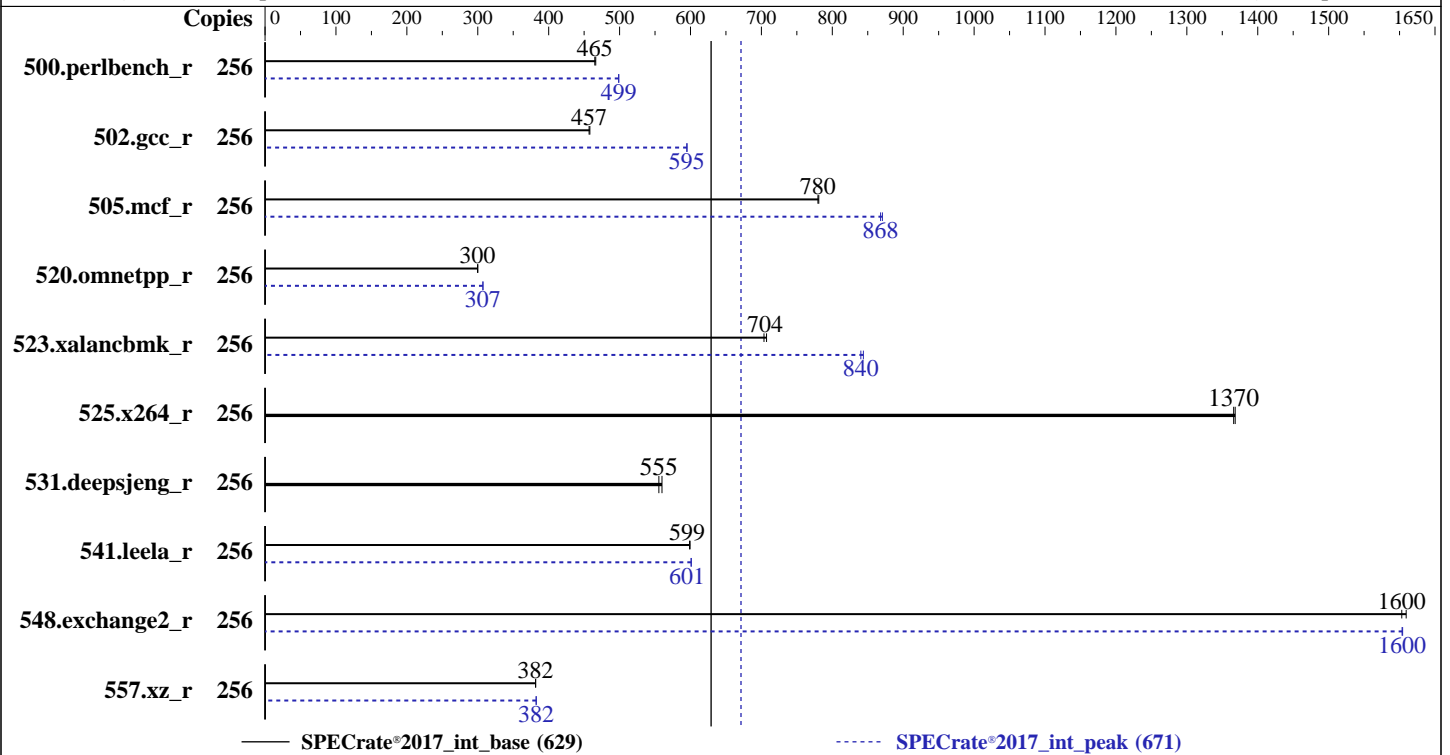
A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

$SPECrate^{®}2017\_int\_base = 629$

$SPECrate^{®}2017\_int\_peak = 671$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2021

Hardware Availability: Aug-2019

Software Availability: Sep-2021

Copies

Benchmark	Copies	base	peak
500.perlbench_r	256	465	499
502.gcc_r	256	457	595
505.mcf_r	256	780	868
520.omnetpp_r	256	300	307
523.xalancbmk_r	256	704	840
525.x264_r	256	1370	
531.deepsjeng_r	256	555	
541.leela_r	256	599	601
548.exchange2_r	256	1600	1600
557.xz_r	256	382	382

———— SPECrate®2017_int_base (629)　　　- - - - - SPECrate®2017_int_peak (671)

Hardware

CPU Name: AMD EPYC 7702

 Max MHz: 3350

 Nominal: 2000

Enabled: 128 cores, 2 chips, 2 threads/core

Orderable: 1,2 chips

Cache L1: 32 KB I + 32 KB D on chip per core

 L2: 512 KB I+D on chip per core

 L3: 256 MB I+D on chip per chip, 16 MB shared / 4 cores

 Other: None

Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)

Storage: 1 x 200 GB SATA III SSD

Other: None

Software

OS: Ubuntu 20.04.3 LTS
　　　Kernel 5.4.0-88-generic

Compiler: C/C++/Fortran: Version 3.0.0 of AOCC

Parallel: No

Firmware: Version 2.2 released Aug-2021

File System: ext4

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 32/64-bit

Other: jemalloc: jemalloc memory allocator library v5.1.0

Power Management: BIOS set to prefer performance at the cost of additional power usage.

Standard Performance Evaluation Corporation (info@spec.org)　　　https://www.spec.org/

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
500.perlbench_r	256	**876**	**465**	874	466			256	**817**	**499**	817	499		
502.gcc_r	256	**793**	**457**	791	458			256	609	595	**610**	**595**		
505.mcf_r	256	**531**	**780**	530	781			256	475	871	**477**	**868**		
520.omnetpp_r	256	1119	300	**1121**	**300**			256	1093	307	**1093**	**307**		
523.xalancbmk_r	256	**384**	**704**	382	707			256	**322**	**840**	320	844		
525.x264_r	256	**328**	**1370**	328	1370			256	**328**	**1370**	328	1370		
531.deepsjeng_r	256	524	560	**528**	**555**			256	524	560	**528**	**555**		
541.leela_r	256	707	599	**708**	**599**			256	**706**	**601**	705	601		
548.exchange2_r	256	**418**	**1600**	417	1610			256	418	1600	**418**	**1600**		
557.xz_r	256	**725**	**382**	724	382			256	**723**	**382**	723	383		
SPECrate®2017_int_base =		**629**												
SPECrate®2017_int_peak =		**671**												

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.
```

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Operating System Notes (Continued)

```
To enable Transparent Hugepages (THP) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'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_aocc300_milan_B_lib/lib;/home/cpu2017/amd_rate_a
      occ300_milan_B_lib/lib32:"
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using OpenSUSE 15.2

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2
```

Platform Notes

```
BIOS Settings:
Determinism Control = Manual
Determinism Slider = Power
cTDP Control = Manual
cTDP = 200
Package Power Limit Control = Manual
Package Power Limit = 200
```

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Platform Notes (Continued)

```
APBDIS = 1
NUMA Nodes Per Socket = NPS4

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on h12dst-7702 Fri Oct  1 17:41:43 2021

 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 7702 64-Core Processor
       2  "physical id"s (chips)
       256 "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 : 64
       siblings  : 128
       physical 0: cores 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 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
       physical 1: cores 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 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

 From lscpu from util-linux 2.34:
    Architecture:             x86_64
    CPU op-mode(s):           32-bit, 64-bit
    Byte Order:               Little Endian
    Address sizes:            43 bits physical, 48 bits virtual
    CPU(s):                   256
    On-line CPU(s) list:      0-255
    Thread(s) per core:       2
    Core(s) per socket:       64
    Socket(s):                2
    NUMA node(s):             32
    Vendor ID:                AuthenticAMD
    CPU family:               23
    Model:                    49
    Model name:               AMD EPYC 7702 64-Core Processor
    Stepping:                 0
    Frequency boost:          enabled
    CPU MHz:                  1804.045
    CPU max MHz:              2000.0000
    CPU min MHz:              1500.0000
    BogoMIPS:                 4000.19
```

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Platform Notes (Continued)

```
    Virtualization:                 AMD-V
    L1d cache:                      4 MiB
    L1i cache:                      4 MiB
    L2 cache:                       64 MiB
    L3 cache:                       512 MiB
    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
    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 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; Full AMD retpoline, IBPB conditional,
    IBRS_FW, STIBP conditional, RSB filling
```

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Platform Notes (Continued)

```
     Vulnerability Srbds:             Not affected
     Vulnerability Tsx async abort:   Not affected
     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 pni pclmulqdq monitor ssse3 fma cx16 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 sme ssbd mba sev ibrs ibpb
   stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb
   sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
   cqm_mbm_local clzero irperf xsaveerptr wbnoinvd arat npt lbrv svm_lock nrip_save
   tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic
   v_vmsave_vmload vgif umip rdpid overflow_recov succor smca

 From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL
     L1d       32K       4M    8 Data              1
     L1i       32K       4M    8 Instruction       1
     L2       512K      64M    8 Unified           2
     L3        16M     512M   16 Unified           3

 /proc/cpuinfo cache data
    cache size : 512 KB

 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 32 nodes (0-31)
   node 0 cpus: 0 1 2 3 128 129 130 131
   node 0 size: 32127 MB
   node 0 free: 31935 MB
   node 1 cpus: 4 5 6 7 132 133 134 135
   node 1 size: 32254 MB
   node 1 free: 32035 MB
   node 2 cpus: 8 9 10 11 136 137 138 139
   node 2 size: 32254 MB
   node 2 free: 32105 MB
   node 3 cpus: 12 13 14 15 140 141 142 143
   node 3 size: 32253 MB
   node 3 free: 32097 MB
   node 4 cpus: 16 17 18 19 144 145 146 147
   node 4 size: 32254 MB
   node 4 free: 32108 MB
   node 5 cpus: 20 21 22 23 148 149 150 151
   node 5 size: 32229 MB
   node 5 free: 32075 MB
   node 6 cpus: 24 25 26 27 152 153 154 155
```

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Platform Notes (Continued)

```
    node 6 size: 32254 MB
    node 6 free: 32102 MB
    node 7 cpus: 28 29 30 31 156 157 158 159
    node 7 size: 32253 MB
    node 7 free: 32116 MB
    node 8 cpus: 32 33 34 35 160 161 162 163
    node 8 size: 32254 MB
    node 8 free: 32127 MB
    node 9 cpus: 36 37 38 39 164 165 166 167
    node 9 size: 32254 MB
    node 9 free: 32129 MB
    node 10 cpus: 40 41 42 43 168 169 170 171
    node 10 size: 32254 MB
    node 10 free: 32132 MB
    node 11 cpus: 44 45 46 47 172 173 174 175
    node 11 size: 32253 MB
    node 11 free: 32127 MB
    node 12 cpus: 48 49 50 51 176 177 178 179
    node 12 size: 32254 MB
    node 12 free: 32102 MB
    node 13 cpus: 52 53 54 55 180 181 182 183
    node 13 size: 32254 MB
    node 13 free: 32105 MB
    node 14 cpus: 56 57 58 59 184 185 186 187
    node 14 size: 32254 MB
    node 14 free: 32022 MB
    node 15 cpus: 60 61 62 63 188 189 190 191
    node 15 size: 32241 MB
    node 15 free: 32000 MB
    node 16 cpus: 64 65 66 67 192 193 194 195
    node 16 size: 32254 MB
    node 16 free: 32019 MB
    node 17 cpus: 68 69 70 71 196 197 198 199
    node 17 size: 32254 MB
    node 17 free: 32087 MB
    node 18 cpus: 72 73 74 75 200 201 202 203
    node 18 size: 32254 MB
    node 18 free: 32112 MB
    node 19 cpus: 76 77 78 79 204 205 206 207
    node 19 size: 32253 MB
    node 19 free: 32092 MB
    node 20 cpus: 80 81 82 83 208 209 210 211
    node 20 size: 32254 MB
    node 20 free: 32136 MB
    node 21 cpus: 84 85 86 87 212 213 214 215
    node 21 size: 32254 MB
    node 21 free: 32139 MB
```

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```
     node 22 cpus: 88 89 90 91 216 217 218 219
     node 22 size: 32254 MB
     node 22 free: 32140 MB
     node 23 cpus: 92 93 94 95 220 221 222 223
     node 23 size: 32253 MB
     node 23 free: 32136 MB
     node 24 cpus: 96 97 98 99 224 225 226 227
     node 24 size: 32254 MB
     node 24 free: 32130 MB
     node 25 cpus: 100 101 102 103 228 229 230 231
     node 25 size: 32254 MB
     node 25 free: 32129 MB
     node 26 cpus: 104 105 106 107 232 233 234 235
     node 26 size: 32254 MB
     node 26 free: 32104 MB
     node 27 cpus: 108 109 110 111 236 237 238 239
     node 27 size: 32253 MB
     node 27 free: 32112 MB
     node 28 cpus: 112 113 114 115 240 241 242 243
     node 28 size: 32254 MB
     node 28 free: 32134 MB
     node 29 cpus: 116 117 118 119 244 245 246 247
     node 29 size: 32254 MB
     node 29 free: 32138 MB
     node 30 cpus: 120 121 122 123 248 249 250 251
     node 30 size: 32254 MB
     node 30 free: 32122 MB
     node 31 cpus: 124 125 126 127 252 253 254 255
     node 31 size: 32250 MB
     node 31 free: 32132 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
```

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Platform Notes (Continued)

```
 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  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  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  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  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  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
```

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Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

Platform Notes (Continued)

```
     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

 From /proc/meminfo
    MemTotal:       1056724908 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /sbin/tuned-adm active
     Current active profile: throughput-performance

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

 /usr/bin/lsb_release -d
    Ubuntu 20.04.3 LTS

 From /etc/*release* /etc/*version*
    debian_version: bullseye/sid
    os-release:
       NAME="Ubuntu"
       VERSION="20.04.3 LTS (Focal Fossa)"
       ID=ubuntu
       ID_LIKE=debian
       PRETTY_NAME="Ubuntu 20.04.3 LTS"
       VERSION_ID="20.04"
       HOME_URL="https://www.ubuntu.com/"
       SUPPORT_URL="https://help.ubuntu.com/"

 uname -a:
    Linux h12dst-7702 5.4.0-88-generic #99-Ubuntu SMP Thu Sep 23 17:29:00 UTC 2021 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
 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: Full AMD retpoline,
```

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Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License: 001176		**Test Date:**	Oct-2021
Test Sponsor: Supermicro		**Hardware Availability:**	Aug-2019
Tested by: Supermicro		**Software Availability:**	Sep-2021

Platform Notes (Continued)

```
                                          IBPB: conditional, IBRS_FW, STIBP:
                                          conditional, RSB filling
  CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
  CVE-2019-11135 (TSX Asynchronous Abort):               Not affected

  run-level 3 Oct 1 17:30

  SPEC is set to: /home/cpu2017
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda3       ext4  178G   18G  152G  11% /

  From /sys/devices/virtual/dmi/id
     Vendor:         Supermicro
     Product:        Super Server
     Serial:         0123456789

  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:
      16x SK Hynix HMAA8GR7AJR4N-XN 64 GB 2 rank 3200

  BIOS:
     BIOS Vendor:        American Megatrends Inc.
     BIOS Version:       2.2
     BIOS Date:          08/31/2021
     BIOS Revision:      5.14

  (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base, peak)
```

Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
C++      | 523.xalancbmk_r(peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
         | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

(Continued on next page)

Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2021

Hardware Availability: Aug-2019

Software Availability: Sep-2021

Compiler Version Notes (Continued)

```
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
C++    | 523.xalancbmk_r(peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
C++    | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
       | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------


==========================================================================
Fortran | 548.exchange2_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
--------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

SPEC CPU®2017 Integer Rate Result

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Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License: 001176	**Test Date:** Oct-2021
Test Sponsor: Supermicro	**Hardware Availability:** Aug-2019
Tested by: Supermicro	**Software Availability:** Sep-2021

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp
-flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-lamdlibm -ljemalloc -lflang -lflangrti

C++ benchmarks:
-m64 -std=c++98 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false
-z muldefs -mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm
-ljemalloc -lflang -lflangrti

Fortran benchmarks:
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2021

Hardware Availability: Aug-2019

Software Availability: Sep-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -z muldefs -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti
```

Base Other Flags

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

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

Peak Portability Flags

500.perlbench_r: `-DSPEC_LINUX_X64 -DSPEC_LP64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LINUX -DSPEC_LP64`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License:	001176	**Test Date:**	Oct-2021
Test Sponsor:	Supermicro	**Hardware Availability:**	Aug-2019
Tested by:	Supermicro	**Software Availability:**	Sep-2021

Peak Optimization Flags

C benchmarks:

```
 500.perlbench_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver3
-fveclib=AMDLIBM -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=false
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

 502.gcc_r: -m32 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -fgnu89-inline
-ljemalloc

 505.mcf_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

 525.x264_r: basepeak = yes

 557.xz_r: Same as 505.mcf_r
```

C++ benchmarks:

Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2021

Hardware Availability: Aug-2019

Software Availability: Sep-2021

Peak Optimization Flags (Continued)

```
520.omnetpp_r: -m64 -std=c++98
-Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -finline-aggressive
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-licm-vrp -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -ljemalloc
```

```
523.xalancbmk_r: -m32 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -finline-aggressive
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-licm-vrp -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-ljemalloc
```

```
531.deepsjeng_r: basepeak = yes
```

```
541.leela_r: Same as 520.omnetpp_r
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti
```

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Supermicro

A+ Server 2124BT-HNTR
(H12DST-B , AMD EPYC 7702)

SPECrate®2017_int_base = 629

SPECrate®2017_int_peak = 671

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Oct-2021

Hardware Availability: Aug-2019

Software Availability: Sep-2021

Peak Other Flags

C benchmarks (except as noted below):
```
-Wno-unused-command-line-argument
```

```
502.gcc_r: -L/usr/lib -Wno-unused-command-line-argument
-L/sppo/bin/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32
```

C++ benchmarks (except as noted below):
```
-Wno-unused-command-line-argument
```

```
523.xalancbmk_r: -L/usr/lib -Wno-unused-command-line-argument
-L/sppo/bin/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32
```

The flags files that were used to format this result can be browsed at
```
http://www.spec.org/cpu2017/flags/aocc300-flags-B2.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Rome-revC.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/aocc300-flags-B2.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Rome-revC.xml
```

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

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