SPEC CPU®2017 Integer Speed Result

Supermicro

A+ Server 2124US-TNRP
(H12DSU-iN , AMD EPYC 7513)

$SPECspeed^{®}2017\_int\_base = 12.4$

$SPECspeed^{®}2017\_int\_peak = 12.6$

CPU2017 License: 0001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Aug-2022
Hardware Availability: Mar-2021
Software Availability: Aug-2022

Threads

Benchmark	Threads	base	peak
600.perlbench_s	64	7.54	
	1		7.67
602.gcc_s	64	13.6	
	1		13.7
605.mcf_s	64	20.6	
	1		20.7
620.omnetpp_s	64	8.40	
	1		8.54
623.xalancbmk_s	64	12.8	
	1		14.0
625.x264_s	64	17.0	
	1		17.1
631.deepsjeng_s	64	6.48	
	1		6.50
641.leela_s	64	5.74	
648.exchange2_s	64	23.2	
	1		23.2
657.xz_s	64	26.2	

SPECspeed®2017_int_base (12.4)   SPECspeed®2017_int_peak (12.6)

Hardware

CPU Name: AMD EPYC 7513
  Max MHz: 3650
  Nominal: 2600
Enabled: 64 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: 128 MB I+D on chip per chip, 32 MB shared / 8 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 22.04.1 LTS
  Kernel 5.15.0-46-generic
Compiler: C/C++/Fortran: Version 3.2.0 of AOCC
Parallel: Yes
Firmware: Version 2.4 released Apr-2022
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc: jemalloc memory allocator library v5.1.0
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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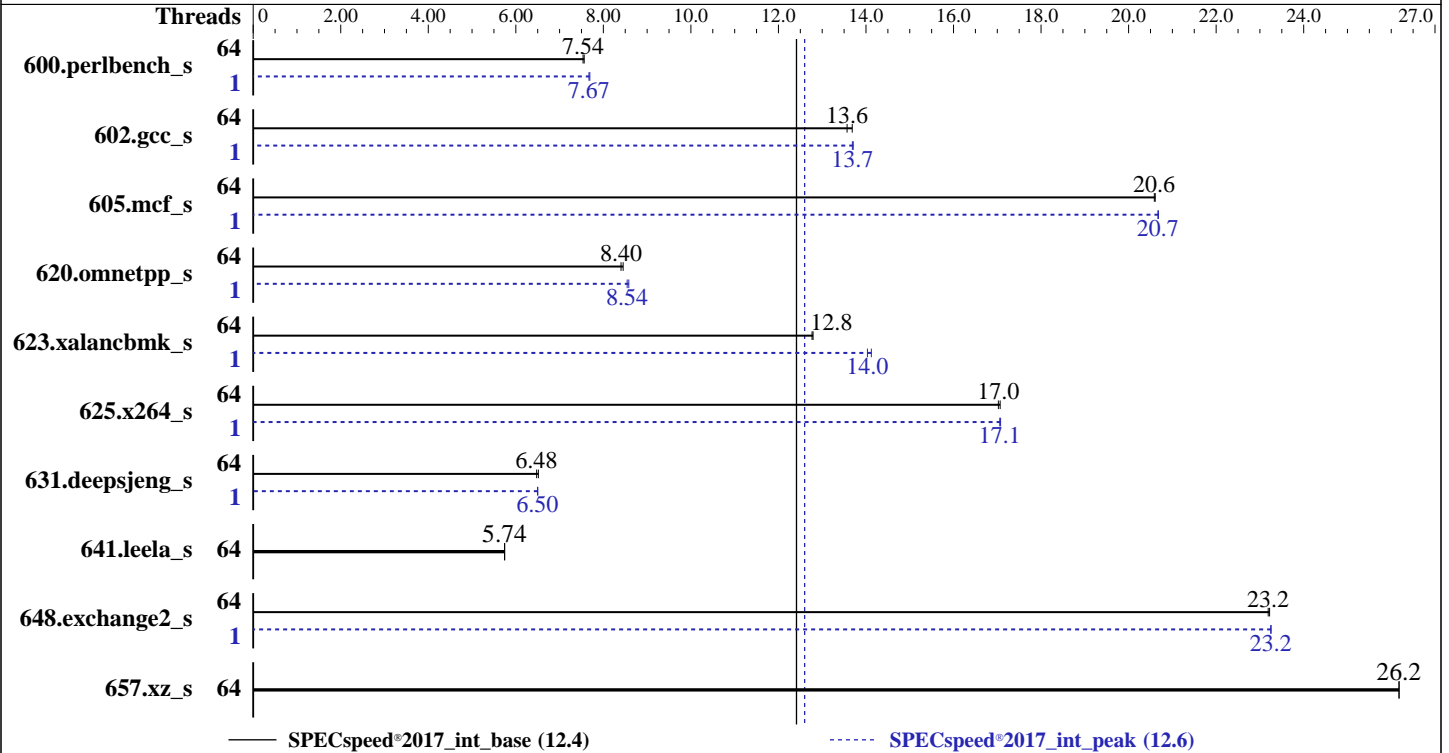SPECspeed®2017_int_peak = 12.6

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	64	235	7.56	**236**	**7.54**			1	**231**	**7.67**	231	7.69		
602.gcc_s	64	291	13.7	**293**	**13.6**			1	290	13.7	**291**	**13.7**		
605.mcf_s	64	229	20.6	**229**	**20.6**			1	228	20.7	**228**	**20.7**		
620.omnetpp_s	64	**194**	**8.40**	193	8.45			1	190	8.58	**191**	**8.54**		
623.xalancbmk_s	64	**111**	**12.8**	111	12.8			1	100	14.1	**101**	**14.0**		
625.x264_s	64	**104**	**17.0**	103	17.1			1	103	17.1	**103**	**17.1**		
631.deepsjeng_s	64	**221**	**6.48**	220	6.52			1	220	6.50	**221**	**6.50**		
641.leela_s	64	297	5.75	**297**	**5.74**			64	297	5.75	**297**	**5.74**		
648.exchange2_s	64	**127**	**23.2**	127	23.2			1	**126**	**23.2**	126	23.3		
657.xz_s	64	**236**	**26.2**	236	26.2			64	**236**	**26.2**	236	26.2		
SPECspeed®2017_int_base =		**12.4**												
SPECspeed®2017_int_peak =		**12.6**												

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,
```

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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:
GOMP_CPU_AFFINITY = "0-127"
LD_LIBRARY_PATH =
     "/home/cpu2017/amd_speed_aocc320_milanx_A_lib/lib;/home/cpu2017/amd_spee
     d_aocc320_milanx_A_lib/lib32:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "128"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 631.deepsjeng_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "0"
```

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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
APBDIS = 1
NUMA Nodes Per Socket = NPS4

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on h12dsu-7513 Sat Aug 13 00:41:06 2022

 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 7513 32-Core Processor
       2 "physical id"s (chips)
       128 "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 : 32
       siblings : 64
       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
       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

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Platform Notes (Continued)

```
From lscpu from util-linux 2.37.2:
      Architecture:                  x86_64
      CPU op-mode(s):                32-bit, 64-bit
      Address sizes:                 48 bits physical, 48 bits virtual
      Byte Order:                    Little Endian
      CPU(s):                        128
      On-line CPU(s) list:           0-127
      Vendor ID:                     AuthenticAMD
      Model name:                    AMD EPYC 7513 32-Core Processor
      CPU family:                    25
      Model:                         1
      Thread(s) per core:            2
      Core(s) per socket:            32
      Socket(s):                     2
      Stepping:                      1
      Frequency boost:               enabled
      CPU max MHz:                   3681.6399
      CPU min MHz:                   1500.0000
      BogoMIPS:                      5199.85
      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 movbe popcnt
    aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a
    misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb
    bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
    ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 invpcid 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 rdpru wbnoinvd amd_ppin arat
    npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
    pausefilter pfthreshold v_vmsave_vmload vgif v_spec_ctrl umip pku ospke vaes
    vpclmulqdq rdpid overflow_recov succor smca
      Virtualization:                AMD-V
      L1d cache:                     2 MiB (64 instances)
      L1i cache:                     2 MiB (64 instances)
      L2 cache:                      32 MiB (64 instances)
      L3 cache:                      256 MiB (8 instances)
      NUMA node(s):                  8
      NUMA node0 CPU(s):             0-7,64-71
      NUMA node1 CPU(s):             8-15,72-79
      NUMA node2 CPU(s):             16-23,80-87
      NUMA node3 CPU(s):             24-31,88-95
      NUMA node4 CPU(s):             32-39,96-103
      NUMA node5 CPU(s):             40-47,104-111
      NUMA node6 CPU(s):             48-55,112-119
      NUMA node7 CPU(s):             56-63,120-127
```

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Platform Notes (Continued)

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

  From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL   SETS PHY-LINE COHERENCY-SIZE
     L1d        32K       2M    8 Data           1     64        1             64
     L1i        32K       2M    8 Instruction    1     64        1             64
     L2        512K      32M    8 Unified        2   1024        1             64
     L3         32M     256M   16 Unified        3  32768        1             64

  /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: 8 nodes (0-7)
    node 0 cpus: 0 1 2 3 4 5 6 7 64 65 66 67 68 69 70 71
    node 0 size: 128824 MB
    node 0 free: 127898 MB
    node 1 cpus: 8 9 10 11 12 13 14 15 72 73 74 75 76 77 78 79
    node 1 size: 129019 MB
    node 1 free: 127993 MB
    node 2 cpus: 16 17 18 19 20 21 22 23 80 81 82 83 84 85 86 87
    node 2 size: 128984 MB
    node 2 free: 127813 MB
    node 3 cpus: 24 25 26 27 28 29 30 31 88 89 90 91 92 93 94 95
    node 3 size: 129007 MB
    node 3 free: 128173 MB
    node 4 cpus: 32 33 34 35 36 37 38 39 96 97 98 99 100 101 102 103
    node 4 size: 129019 MB
    node 4 free: 128244 MB
    node 5 cpus: 40 41 42 43 44 45 46 47 104 105 106 107 108 109 110 111
    node 5 size: 129019 MB
    node 5 free: 128226 MB
    node 6 cpus: 48 49 50 51 52 53 54 55 112 113 114 115 116 117 118 119
```

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Platform Notes (Continued)

```
   node 6 size: 129019 MB
   node 6 free: 128170 MB
   node 7 cpus: 56 57 58 59 60 61 62 63 120 121 122 123 124 125 126 127
   node 7 size: 129014 MB
   node 7 free: 128202 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  12  12  12  32  32  32  32
     1:  12  10  12  12  32  32  32  32
     2:  12  12  10  12  32  32  32  32
     3:  12  12  12  10  32  32  32  32
     4:  32  32  32  32  10  12  12  12
     5:  32  32  32  32  12  10  12  12
     6:  32  32  32  32  12  12  10  12
     7:  32  32  32  32  12  12  12  10

 From /proc/meminfo
    MemTotal:       1056674572 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /sbin/tuned-adm active
     Current active profile: balanced

 /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 h12dsu-7513 5.15.0-46-generic #49-Ubuntu SMP Thu Aug 4 18:03:25 UTC 2022 x86_64
    x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:
```

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Platform Notes (Continued)

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


run-level 5 Aug 12 09:21


SPEC is set to: /home/cpu2017
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext4  182G   20G  153G  12% /


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


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:
    16x NO DIMM Unknown
    16x SK Hynix HMAA8GR7AJR4N-XN 64 GB 2 rank 3200


BIOS:
   BIOS Vendor:      American Megatrends Inc.
   BIOS Version:     2.4
   BIOS Date:        04/19/2022
   BIOS Revision:    5.22


(End of data from sysinfo program)
```

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Compiler Version Notes

```
==============================================================================
C        | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base,
         | peak) 625.x264_s(base, peak) 657.xz_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------


==============================================================================
C++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
         | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------


==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

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Base Portability Flags

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

Base Optimization Flags

C benchmarks:
`-m64 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp`
`-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 -march=znver3`
`-fveclib=AMDLIBM -ffast-math -fopenmp -flto -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`
`-DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang`

C++ benchmarks:
`-m64 -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 -march=znver3`
`-fveclib=AMDLIBM -ffast-math -fopenmp -flto`
`-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`
`-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP`
`-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang`

Fortran benchmarks:
`-m64 -Wl,-mllvm -Wl,-inline-recursion=4`
`-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split`
`-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize`

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Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

SPEC CPU®2017 Integer Speed Result

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Supermicro

A+ Server 2124US-TNRP
(H12DSU-iN , AMD EPYC 7513)

SPECspeed®2017_int_base = 12.4

SPECspeed®2017_int_peak = 12.6

CPU2017 License:	0001176	**Test Date:**	Aug-2022
Test Sponsor:	Supermicro	**Hardware Availability:**	Mar-2021
Tested by:	Supermicro	**Software Availability:**	Aug-2022

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -z muldefs
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
```

Base Other Flags

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

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

Fortran benchmarks:
```
-Wno-return-type
```

Peak Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

(Continued on next page)

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CPU2017 License: 0001176   **Test Date:**   Aug-2022
Test Sponsor: Supermicro   **Hardware Availability:** Mar-2021
Tested by: Supermicro   **Software Availability:** Aug-2022

Peak Optimization Flags (Continued)

600.perlbench_s: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp
-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 -ffast-math -fopenmp
-flto -fstruct-layout=5 -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 -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

602.gcc_s: Same as 600.perlbench_s

605.mcf_s: Same as 600.perlbench_s

625.x264_s: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-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 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -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
-mllvm -do-block-reorder=aggressive -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: -m64 -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 -ffast-math -fopenmp
-flto -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

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Supermicro

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CPU2017 License: 0001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Aug-2022
Hardware Availability: Mar-2021
Software Availability: Aug-2022

Peak Optimization Flags (Continued)

620.omnetpp_s (continued):
```
-mllvm -global-vectorize-slp=true
-fvirtual-function-elimination -fvisibility=hidden
-DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang
```

623.xalancbmk_s: `-m64 -Wl,-mllvm -Wl,-function-specialize`
```
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -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
-DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang
```

631.deepsjeng_s: `-m64 -Wl,-mllvm -Wl,-do-block-reorder=aggressive`
```
-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
-march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -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
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang
```

641.leela_s: `basepeak = yes`

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

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Test Sponsor: Supermicro

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Test Date: Aug-2022

Hardware Availability: Mar-2021

Software Availability: Aug-2022

Peak Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp=libomp -lomp
-lamdlibm -ljemalloc -lflang
```

Peak Other Flags

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

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

Fortran benchmarks:
```
-Wno-return-type
```

The flags files that were used to format this result can be browsed at
```
http://www.spec.org/cpu2017/flags/aocc320-flags-A1.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Milan-revG.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/aocc320-flags-A1.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Milan-revG.xml
```

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