



SPEC CPU®2017 Floating Point Rate Result

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GIGA-BYTE TECHNOLOGY CO., LTD.

SPECrate®2017_fp_base = 214

E252-P30-00 (Ampere Altra Q80-33 3.0 GHz)

SPECrate®2017_fp_peak = 220

CPU2017 License: 9082

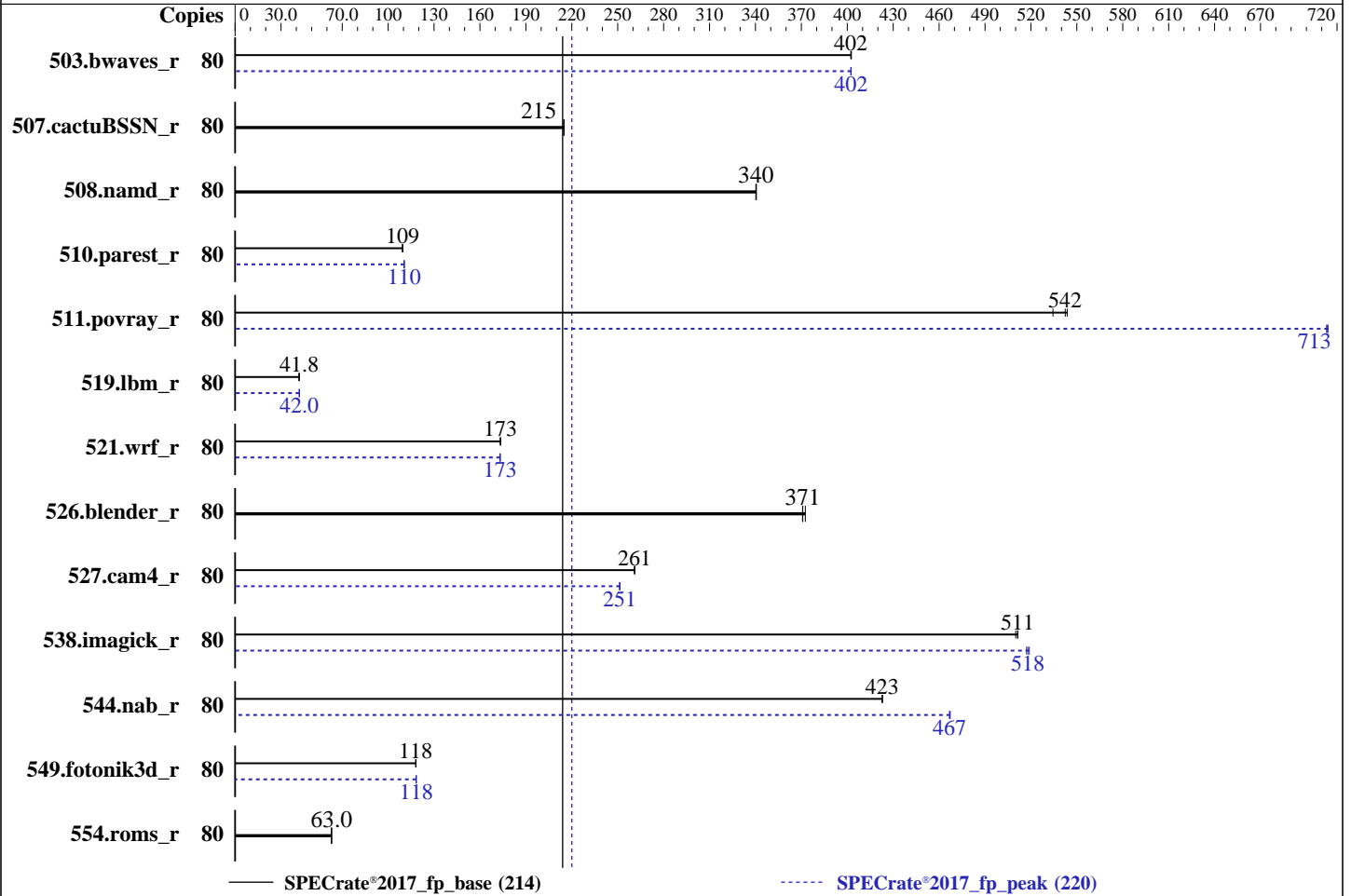
Test Date: Feb-2021

Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.

Hardware Availability: Mar-2021

Tested by: GIGA-BYTE TECHNOLOGY CO., LTD.

Software Availability: Dec-2020



Hardware

CPU Name: Ampere Altra Q80-33
 Max MHz: 3300
 Nominal: 3000
 Enabled: 80 cores, 1 chip
 Orderable: 1 chips
 Cache L1: 64 KB I + 64 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 32 MB I+D on chip per chip
 Other: None
 Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
 Storage: 811 GB, NVME, M.2, PCIe Gen3
 Other: None

Software

OS: CentOS Linux release 8.3.2011
 4.18.0-240.1.1.el8_3.aarch64
 Compiler: C/C++/Fortran: Version 10.2.1 of Ampere GCC
 Parallel: No
 Firmware: Version F05 released Jan-2021
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: Jemalloc memory allocator library v5.2.1
 Power Management: 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	80	1994	402	1992	403	1994	402	80	1993	403	1993	402	1994	402
507.cactuBSSN_r	80	472	215	471	215	471	215	80	472	215	471	215	471	215
508.namd_r	80	223	340	223	340	223	341	80	223	340	223	340	223	341
510.parest_r	80	1912	109	1912	109	1913	109	80	1896	110	1892	111	1895	110
511.povray_r	80	344	542	344	544	350	534	80	262	714	262	713	262	713
519.lbm_r	80	2014	41.9	2019	41.8	2016	41.8	80	2009	42.0	2010	41.9	2009	42.0
521.wrf_r	80	1034	173	1033	173	1034	173	80	1035	173	1035	173	1034	173
526.blender_r	80	327	373	329	371	328	371	80	327	373	329	371	328	371
527.cam4_r	80	536	261	536	261	536	261	80	557	251	556	252	557	251
538.imagick_r	80	389	511	389	511	390	510	80	383	519	384	518	385	517
544.nab_r	80	318	423	318	423	318	423	80	288	467	288	467	288	467
549.fotonik3d_r	80	2637	118	2640	118	2641	118	80	2635	118	2634	118	2635	118
554.roms_r	80	2018	63.0	2017	63.0	2016	63.1	80	2018	63.0	2017	63.0	2016	63.1

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

Binaries were compiled on a system with 2x Ampere Altra Q80-33 CPU chips + 256 GB Memory using CentOS 8.3.

Ampere GCC 10.2.1 is available via <https://github.com/AmpereComputing/ampere-gcc/releases>

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size
Set dirty_ratio=8 to limit dirty cache to 8% of memory
i.e. echo 8 | sudo tee /proc/sys/vm/dirty_ratio
Set swappiness=1 to swap only if necessary
i.e. echo 1 | sudo tee /proc/sys/vm/swappiness
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
i.e. echo 1 | sudo tee /proc/sys/vm/zone_reclaim_mode
Set drop_caches=3 to reset caches before invoking runcpu
i.e. echo 3 | sudo tee /proc/sys/vm/drop_caches
Set numa_balancing=0 to disable automatic numa balancing

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Operating System Notes (Continued)

```
i.e. echo 0 | sudo tee /proc/sys/kernel/numa_balancing
Switch off all ktune and tuned settings
i.e. sudo tuned-adm off
Transparent huge pages set to 'never'
i.e. sudo bash -c "echo never > /sys/kernel/mm/transparent_hugepage/enabled"

runcpu command invoked through numactl i.e.
numactl --interleave=0-3 runcpu
```

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =
"/home/ampctest/ampere_spec2017/jemalloc/install/lib:/home/ampctest/ampere_spec2017/gcc/install/lib64:/home/ampctest/ampere_spec2017/gcc/install/lib:/home/ampere_spec2017/gcc/install/lib64:/home/ampere_spec2017/jemalloc/install/lib:"
```

General Notes

Jemalloc v5.2.1 is available via <https://github.com/jemalloc/jemalloc/releases/download/5.2.1/jemalloc-5.2.1.tar.bz2>
It was built on CentOS 8.3 using Version 10.2.1 of Ampere GCC with configure options
`--prefix=/home/ampctest/jemalloc/install --with-lg-quantum=3`

- NA: 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.
- 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.
- NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Platform Notes

BIOS settings:
Chipset > ANC Mode > Set to Quadrant

Sysinfo program /home/ampere_spec2017/spec2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Thu Feb 18 20:02:01 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>

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Platform Notes (Continued)

From /proc/cpuinfo

```

*
* Did not identify cpu model.  If you would
* like to write your own sysinfo program, see
* www.spec.org/cpu2017/config.html#sysinfo
*
*
* 0 "physical id" tags found.  Perhaps this is an older system,
* or a virtualized system.  Not attempting to guess how to
* count chips/cores for this system.
*
    80 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)

```

From lscpu:

```

Architecture:      aarch64
Byte Order:        Little Endian
CPU(s):            80
On-line CPU(s) list: 0-79
Thread(s) per core: 1
Core(s) per socket: 80
Socket(s):         1
NUMA node(s):     4
Vendor ID:         ARM
Model:             1
Stepping:          r3p1
CPU max MHz:       3300.0000
CPU min MHz:       1000.0000
BogoMIPS:          50.00
L1d cache:         64K
L1i cache:         64K
L2 cache:          1024K
NUMA node0 CPU(s): 0-19
NUMA node1 CPU(s): 20-39
NUMA node2 CPU(s): 40-59
NUMA node3 CPU(s): 60-79
Flags:              fp asimd evtstrm aes pmull sha1 sha2 crc32 atomics fphp asimdhp
cpuid asimdrdm lrcpc dcpop asimddp ssbs

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
node 0 size: 64513 MB
node 0 free: 63833 MB

```

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Platform Notes (Continued)

```

node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
node 1 size: 65459 MB
node 1 free: 65118 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
node 2 size: 65459 MB
node 2 free: 64773 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 3 size: 65424 MB
node 3 free: 64638 MB
node distances:
node  0  1  2  3
  0:  10  11  11  12
  1:  11  10  12  11
  2:  11  12  10  11
  3:  12  11  11  10

```

From /proc/meminfo

```

MemTotal:      267117376 kB
HugePages_Total:      0
Hugepagesize:    524288 kB

```

```

/sbin/tuned-adm active
  No current active profile.

```

```

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

```

```

/usr/bin/lsb_release -d
CentOS Linux release 8.3.2011

```

From /etc/*release* /etc/*version*

```

centos-release: CentOS Linux release 8.3.2011
centos-release-upstream: Derived from Red Hat Enterprise Linux 8.3
os-release:
  NAME="CentOS Linux"
  VERSION="8"
  ID="centos"
  ID_LIKE="rhel fedora"
  VERSION_ID="8"
  PLATFORM_ID="platform:el8"
  PRETTY_NAME="CentOS Linux 8"
  ANSI_COLOR="0;31"
  redhat-release: CentOS Linux release 8.3.2011
  system-release: CentOS Linux release 8.3.2011
  system-release-cpe: cpe:/o:centos:centos:8

```

uname -a:

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Platform Notes (Continued)

Linux localhost.localdomain 4.18.0-240.1.1.el8_3.aarch64 #1 SMP Thu Nov 19 22:13:39 UTC 2020 aarch64 aarch64 aarch64 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
CVE-2017-5753 (Spectre variant 1):	Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling):	Not affected
CVE-2019-11135 (TSX Asynchronous Abort):	Not affected

run-level 3 Feb 18 19:32

SPEC is set to: /home/ampere_spec2017/spec2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/cl-home	xfs	811G	119G	692G	15%	/home

From /sys/devices/virtual/dmi/id

```
Vendor:      GIGABYTE
Product:     E252-P30-00
Product Family: Server
Serial:      01234567890123456789AB
```

Additional information from dmidecode 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:

```
1x Array 1 Manufacturer 10 Array 1 Part Number 10
1x Array 1 Manufacturer 12 Array 1 Part Number 12
1x Array 1 Manufacturer 14 Array 1 Part Number 14
1x Array 1 Manufacturer 16 Array 1 Part Number 16
1x Array 1 Manufacturer 2 Array 1 Part Number 2
1x Array 1 Manufacturer 4 Array 1 Part Number 4
1x Array 1 Manufacturer 6 Array 1 Part Number 6
1x Array 1 Manufacturer 8 Array 1 Part Number 8
8x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200
```

BIOS:

```
BIOS Vendor:      GIGABYTE
BIOS Version:     F05
```

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Platform Notes (Continued)

BIOS Date: 01/19/2021
BIOS Revision: 5.15
Firmware Revision: 1.3

(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)  
-----
```

```
gcc (Ampere Computing Build 11923 20201215) 10.2.1 20201216  
Copyright (C) 2020 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
-----
```

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

```
g++ (Ampere Computing Build 11923 20201215) 10.2.1 20201216  
Copyright (C) 2020 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
-----
```

```
=====  
C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak)  
-----
```

```
g++ (Ampere Computing Build 11923 20201215) 10.2.1 20201216  
Copyright (C) 2020 Free Software Foundation, Inc.  
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gcc (Ampere Computing Build 11923 20201215) 10.2.1 20201216  
Copyright (C) 2020 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
-----
```

```
=====  
C++, C, Fortran | 507.cactuBSSN_r(base, peak)  
-----
```

```
g++ (Ampere Computing Build 11923 20201215) 10.2.1 20201216  
Copyright (C) 2020 Free Software Foundation, Inc.  
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```

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Compiler Version Notes (Continued)

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GNU Fortran (Ampere Computing Build 11923 20201215) 10.2.1 20201216

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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

=====
Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
| 554.roms_r(base, peak)

GNU Fortran (Ampere Computing Build 11923 20201215) 10.2.1 20201216

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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

=====
Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

GNU Fortran (Ampere Computing Build 11923 20201215) 10.2.1 20201216

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gcc (Ampere Computing Build 11923 20201215) 10.2.1 20201216

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Base Compiler Invocation

C benchmarks:

gcc

C++ benchmarks:

g++

Fortran benchmarks:

gfortran

(Continued on next page)



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Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```
gfortran gcc
```

Benchmarks using both C and C++:

```
g++ gcc
```

Benchmarks using Fortran, C, and C++:

```
g++ gcc gfortran
```

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 -fconvert=big-endian -DSPEC_LP64
526.blender_r: -funsigned-char -DSPEC_LINUX -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:

```
-mabi=lp64 -std=c99 -L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -g -Ofast
-mcpu=neoverse-n1 -flto -fno-strict-aliasing -ljemalloc
```

C++ benchmarks:

```
-mabi=lp64 -std=c++03 -L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -g -Ofast
-mcpu=neoverse-n1 -flto -ljemalloc
```

Fortran benchmarks:

```
-mabi=lp64 -L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
```

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -g -Ofast
-mcpu=neoverse-n1 -flto -fno-stack-arrays -ljemalloc
```

Benchmarks using both Fortran and C:

```
-mabi=lp64 -std=c99 -L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -g -Ofast
-mcpu=neoverse-n1 -flto -fno-stack-arrays -fno-strict-aliasing
-ljemalloc
```

Benchmarks using both C and C++:

```
-mabi=lp64 -std=c++03 -std=c99
-L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -g -Ofast
-mcpu=neoverse-n1 -flto -fno-strict-aliasing -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-mabi=lp64 -std=c++03 -std=c99
-L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -g -Ofast
-mcpu=neoverse-n1 -flto -fno-stack-arrays -fno-strict-aliasing
-ljemalloc
```

Base Other Flags

C benchmarks:

```
-Wl,-Map,mapfile
```

C++ benchmarks:

```
-Wl,-Map,mapfile
```

Fortran benchmarks:

```
-fallow-argument-mismatch -Wl,-Map,mapfile
```

Benchmarks using both Fortran and C:

```
-fallow-argument-mismatch -Wl,-Map,mapfile
```

Benchmarks using both C and C++:

```
-Wl,-Map,mapfile
```

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Base Other Flags (Continued)

Benchmarks using Fortran, C, and C++:

-fallow-argument-mismatch -Wl,-Map,mapfile

Peak Compiler Invocation

C benchmarks:

gcc

C++ benchmarks:

g++

Fortran benchmarks:

gfortran

Benchmarks using both Fortran and C:

gfortran gcc

Benchmarks using both C and C++:

g++ gcc

Benchmarks using Fortran, C, and C++:

g++ gcc gfortran

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

-mabi=lp64 -std=c99 -L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib -fprofile-generate
-fprofile-use -g -Ofast -mcpu=neoverse-n1 -funroll-loops -flto=32
--param early-inlining-insns=96 --param max-inline-insns-auto=64
--param inline-unit-growth=96 -ljemalloc

C++ benchmarks:

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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E252-P30-00 (Ampere Altra Q80-33 3.0 GHz)

SPECrate®2017_fp_peak = 220

CPU2017 License: 9082

Test Date: Feb-2021

Test Sponsor: GIGA-BYTE TECHNOLOGY CO., LTD.

Hardware Availability: Mar-2021

Tested by: GIGA-BYTE TECHNOLOGY CO., LTD.

Software Availability: Dec-2020

Peak Optimization Flags (Continued)

508.namd_r: basepeak = yes

```
510.parest_r: -mabi=lp64 -std=c++03
-L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib
-fprofile-generate -fprofile-use -g -Ofast
-mcpu=neoverse-n1 -funroll-loops -flto=32
--param early-inlining-insns=256
--param max-inline-insns-auto=128
--param inline-unit-growth=256 -ffinite-loops -ljemalloc
```

Fortran benchmarks:

```
503.bwaves_r: -mabi=lp64
-L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib
-fprofile-generate -fprofile-use -g -Ofast
-mcpu=neoverse-n1 -funroll-loops -flto=32
-fno-stack-arrays -ljemalloc
```

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: basepeak = yes

Benchmarks using both Fortran and C:

```
521.wrf_r: -mabi=lp64 -std=c99
-L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib
-fprofile-generate -fprofile-use -g -Ofast
-mcpu=neoverse-n1 -funroll-loops -flto=32
--param early-inlining-insns=96
--param max-inline-insns-auto=64
--param inline-unit-growth=96 -fno-stack-arrays -ljemalloc
```

```
527.cam4_r: -mabi=lp64 -std=c99
-L/home/ampctest/ampere_spec2017/gcc/install/lib64
-L/home/ampctest/ampere_spec2017/gcc/install/lib
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib
-fprofile-generate -fprofile-use -g -Ofast
-mcpu=neoverse-n1 -funroll-loops -flto=32
--param early-inlining-insns=96
--param max-inline-insns-auto=64
```

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Peak Optimization Flags (Continued)

527.cam4_r (continued):

```
--param inline-unit-growth=96 -fno-stack-arrays  
-fno-strict-aliasing -ljemalloc
```

Benchmarks using both C and C++:

```
511.povray_r: -mabi=lp64 -std=c++03 -std=c99  
-L/home/ampctest/ampere_spec2017/gcc/install/lib64  
-L/home/ampctest/ampere_spec2017/gcc/install/lib  
-L/home/ampctest/ampere_spec2017/jemalloc/install/lib  
-fprofile-generate -fprofile-use -g -Ofast  
-mcpu=neoverse-n1 -funroll-loops -flto=32  
--param early-inlining-insns=96  
--param max-inline-insns-auto=64  
--param inline-unit-growth=96  
--param early-inlining-insns=256  
--param max-inline-insns-auto=128  
--param inline-unit-growth=256 -ffinite-loops  
-fno-strict-aliasing -ljemalloc
```

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:

```
-w -Wl,-Map,mapfile
```

C++ benchmarks:

```
-Wl,-Map,mapfile
```

Fortran benchmarks (except as noted below):

```
-Wl,-Map,mapfile
```

554.roms_r: -fallow-argument-mismatch -Wl,-Map,mapfile

Benchmarks using both Fortran and C:

521.wrf_r: -w -fallow-argument-mismatch -Wl,-Map,mapfile

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Software Availability: Dec-2020

Peak Other Flags (Continued)

527.cam4_r: -fallow-argument-mismatch -Wl,-Map,mapfile

Benchmarks using both C and C++:

-Wl,-Map,mapfile

Benchmarks using Fortran, C, and C++:

-fallow-argument-mismatch -Wl,-Map,mapfile

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

<http://www.spec.org/cpu2017/flags/gcc.2021-07-21.html>

<http://www.spec.org/cpu2017/flags/GIGA-BYTE-platform-settings-Altra-rev.2.html>

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

<http://www.spec.org/cpu2017/flags/gcc.2021-07-21.xml>

<http://www.spec.org/cpu2017/flags/GIGA-BYTE-platform-settings-Altra-rev.2.xml>

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