SPEC CPU®2017 Integer Rate Result

Alibaba Cloud

Alibaba Cloud Server Panjiu-M Series
(2.75GHz, T-Head Yitian 710)

SPECrate®2017_int_base =

SPECrate®2017_int_peak =

CPU2017 License:	9070	**Test Date:**	Jun-2022
Test Sponsor:	Alibaba Cloud	**Hardware Availability:**	Sep-2022
Tested by:	Alibaba Cloud	**Software Availability:**	May-2022

SPEC has determined that this result does not comply with the SPEC OSG Guidelines for General Availability and the SPEC CPU 2017 run and reporting rules. Specifically, the submitter has notified SPEC that General Availability requirements were not met.

Copies

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

Hardware

CPU Name:	T-Head Yitian 710
Max MHz:	2750
Nominal:	2750
Enabled:	128 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:	64 MB I+D on chip per die (128 MB per chip)
Other:	None
Memory:	512 GB (8 x 64 GB 2Rx4 PC5-4800B-R)
Storage:	1 x 240 GB SATA SSD
Other:	None

Software

OS:	Anolis OS release 8.6 5.10.84-10.64k.al8.aarch64
Compiler:	C/C++/Fortran: Version 10.2.1 of Red Hat GCC
Parallel:	No
Firmware:	Version 1.2.M1.AL.E.128.91 released Jun-2022
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
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
500.perlbench_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
502.gcc_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
505.mcf_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
520.omnetpp_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
523.xalancbmk_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
525.x264_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
531.deepsjeng_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
541.leela_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
548.exchange2_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
557.xz_r	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

SPECrate®2017_int_base =

SPECrate®2017_int_peak =

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

Compiler Notes

```
Binaries compiled on a Panjiu-M system with 1 x T-Head YiTian710 chip + 512 GB memory using Anolis 8.6
```

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' to prevent applications from allocating more memory resources than
 necessary.
 i.e. sudo bash -c "echo never > /sys/kernel/mm/transparent_hugepage/enabled"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/jemalloc-5.2.1/lib:/opt/rh/devtoolset-10/root/usr/bin//lib64/:/op
     t/rh/devtoolset-10/root/usr/bin//lib/:/opt/rh/devtoolset-10/root/usr/lib
     64:/opt/rh/devtoolset-10/root/usr/lib:/opt/rh/devtoolset-10/root/usr/lib
     64/dyninst:/opt/rh/devtoolset-10/root/usr/lib/dyninst:/opt/rh/devtoolset
     -10/root/usr/lib64:/opt/rh/devtoolset-10/root/usr/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 5.10.84-10.64k.al8.aarch64 GCC10.2.1 with configure options
 --prefix=/root/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:
platform configure > memory configure > Enable NUMA Mode >  Set to SubNuma mode
Yitian710 NUMA Control specifies the number of desired NUMA nodes per chip (default: 2-NUMA nodes).
SubNuma enable Setting: Dividing the chip into separate nodes may improve latency to the last
```


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Platform Notes (Continued)

```
level cache and main memory which may benefit overall performance for NUMA-aware operating systems
and workloads.  Setting to 4-Numa nodes Per chip.
DDR MPAM setting : (Default: Enabled)
MPAM is a family of QoS/SLA services implemented through monitoring and partitioning of all
the memory system components.  It is beneficial for systems hosting VMs, and servers with a
mix of background and demand processes requiring fair-share scheduling.
Set to "disable" to provide best memory bandwidth.

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on localhost.localdomain Fri Jun 10 17:50:12 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
 *
 * 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.
 *
       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.)

 From lscpu from util-linux 2.32.1:
      Architecture:        aarch64
      Byte Order:          Little Endian
      CPU(s):              128
      On-line CPU(s) list: 0-127
      Thread(s) per core:  1
      Core(s) per socket:  128
      Socket(s):           1
      NUMA node(s):        4
```

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Platform Notes (Continued)

```
     Vendor ID:            ARM
     BIOS Vendor ID:       Alibaba
     Model:                0
     BIOS Model name:      To.Be.Filled.By.P
     Stepping:             r0p0
     BogoMIPS:             100.00
     L1d cache:            64K
     L1i cache:            64K
     L2 cache:             1024K
     L3 cache:             65536K
     NUMA node0 CPU(s):    0-31
     NUMA node1 CPU(s):    32-63
     NUMA node2 CPU(s):    64-95
     NUMA node3 CPU(s):    96-127
     Flags:                fp asimd evtstrm aes pmull sha1 sha2 crc32 atomics fphp asimdhp
     cpuid asimdrdm jscvt fcma lrcpc dcpop sha3 sm3 sm4 asimddp sha512 sve asimdfhm dit
     uscat ilrcpc flagm ssbs sb dcpodp sve2 sveaes svepmull svebitperm svesha3 svesm4
     flagm2 frint svei8mm svebf16 i8mm bf16 dgh

 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 20 21 22 23 24 25 26 27
   28 29 30 31
   node 0 size: 130807 MB
   node 0 free: 121857 MB
   node 1 cpus: 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
   node 1 size: 130923 MB
   node 1 free: 121267 MB
   node 2 cpus: 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
   node 2 size: 130923 MB
   node 2 free: 111448 MB
   node 3 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114
   115 116 117 118 119 120 121 122 123 124 125 126 127
   node 3 size: 130859 MB
   node 3 free: 120581 MB
   node distances:
   node   0   1   2   3
```

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Platform Notes (Continued)

```
    0:  10  15  40  40
    1:  15  10  40  40
    2:  40  40  10  15
    3:  40  40  15  10

From /proc/meminfo
   MemTotal:       536078144 kB
   HugePages_Total:        0
   Hugepagesize:     524288 kB

/sbin/tuned-adm active
    Current active profile: virtual-guest

From /etc/*release* /etc/*version*
   anolis-release: Anolis OS release 8.6
   os-release:
      NAME="Anolis OS"
      VERSION="8.6"
      ID="anolis"
      ID_LIKE="rhel fedora centos"
      VERSION_ID="8.6"
      PLATFORM_ID="platform:an8"
      PRETTY_NAME="Anolis OS 8.6"
      ANSI_COLOR="0;31"
   redhat-release: Anolis OS release 8.6
   system-release: Anolis OS release 8.6

uname -a:
   Linux localhost.localdomain 5.10.84-10.64k.al8.aarch64 #1 SMP Wed Jan 26 10:20:10 CST
   2022 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
```

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Platform Notes (Continued)

```
                                                      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 Sep 29 19:51

 SPEC is set to: /home/cpu2017
    Filesystem          Type  Size  Used Avail Use% Mounted on
    /dev/mapper/ao-home xfs   148G   41G  108G  28% /home

 From /sys/devices/virtual/dmi/id
     Vendor:         Alibaba Cloud
     Product:        AliServer-Xuanwu2.0AM-02-1UC1P-5B
     Product Family: TO.Be.Filled.By.PTG

 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:
     7x Hynix HMCG94MEBRA109N 64 GB 2 rank 4800
     1x Hynix HMCG94MEBRA123N 64 GB 2 rank 4800

 BIOS:
    BIOS Vendor:         Alibaba
    BIOS Version:        1.2.M1.AL.E.128.91
    BIOS Date:           06/02/2022

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
        | 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
gcc (GCC) 10.2.1 20210130 (Red Hat 10.2.1-11)
Copyright (C) 2020 Free Software Foundation, Inc.
```

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Compiler Version Notes (Continued)

```
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++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
        | 541.leela_r(base)
------------------------------------------------------------------------------
g++ (GCC) 10.2.1 20210130 (Red Hat 10.2.1-11)
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.
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
GNU Fortran (GCC) 10.2.1 20210130 (Red Hat 10.2.1-11)
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.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
gcc

C++ benchmarks:
g++

Fortran benchmarks:
gfortran

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Base Portability Flags

500.perlbench_r: `-DSPEC_LINUX_AARCH64 -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:
```
-mabi=lp64 -std=c99 -L/opt/rh/devtoolset-10/root/usr/bin//lib64
-L/opt/rh/devtoolset-10/root/usr/bin//lib -L/home/jemalloc-5.2.1/lib -g
-O3 -mcpu=neoverse-n1 -funroll-loops -flto=32
--param early-inlining-insns=96 --param max-inline-insns-auto=64
--param inline-unit-growth=96 -fgnu89-inline -ljemalloc
```

C++ benchmarks:
```
-mabi=lp64 -std=c++03 -L/opt/rh/devtoolset-10/root/usr/bin//lib64
-L/opt/rh/devtoolset-10/root/usr/bin//lib -L/home/jemalloc-5.2.1/lib -g
-O3 -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:
```
-mabi=lp64 -L/opt/rh/devtoolset-10/root/usr/bin//lib64
-L/opt/rh/devtoolset-10/root/usr/bin//lib -L/home/jemalloc-5.2.1/lib -g
-O3 -mcpu=neoverse-n1 -funroll-loops -flto=32
--param ipa-cp-eval-threshold=1 --param ipa-cp-unit-growth=80
--param ipa-cp-max-recursive-depth=8 -fno-inline-functions-called-once
-fstack-arrays -flto-partition=one -ljemalloc
```

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Non-Compliant

Base Other Flags

C benchmarks:
-fcommon -Wl,-Map,mapfile

C++ benchmarks:
-Wl,-Map,mapfile

Fortran benchmarks:
-Wl,-Map,mapfile

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/gcc.2021-07-21.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2017/flags/gcc.2021-07-21.xml

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

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