



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

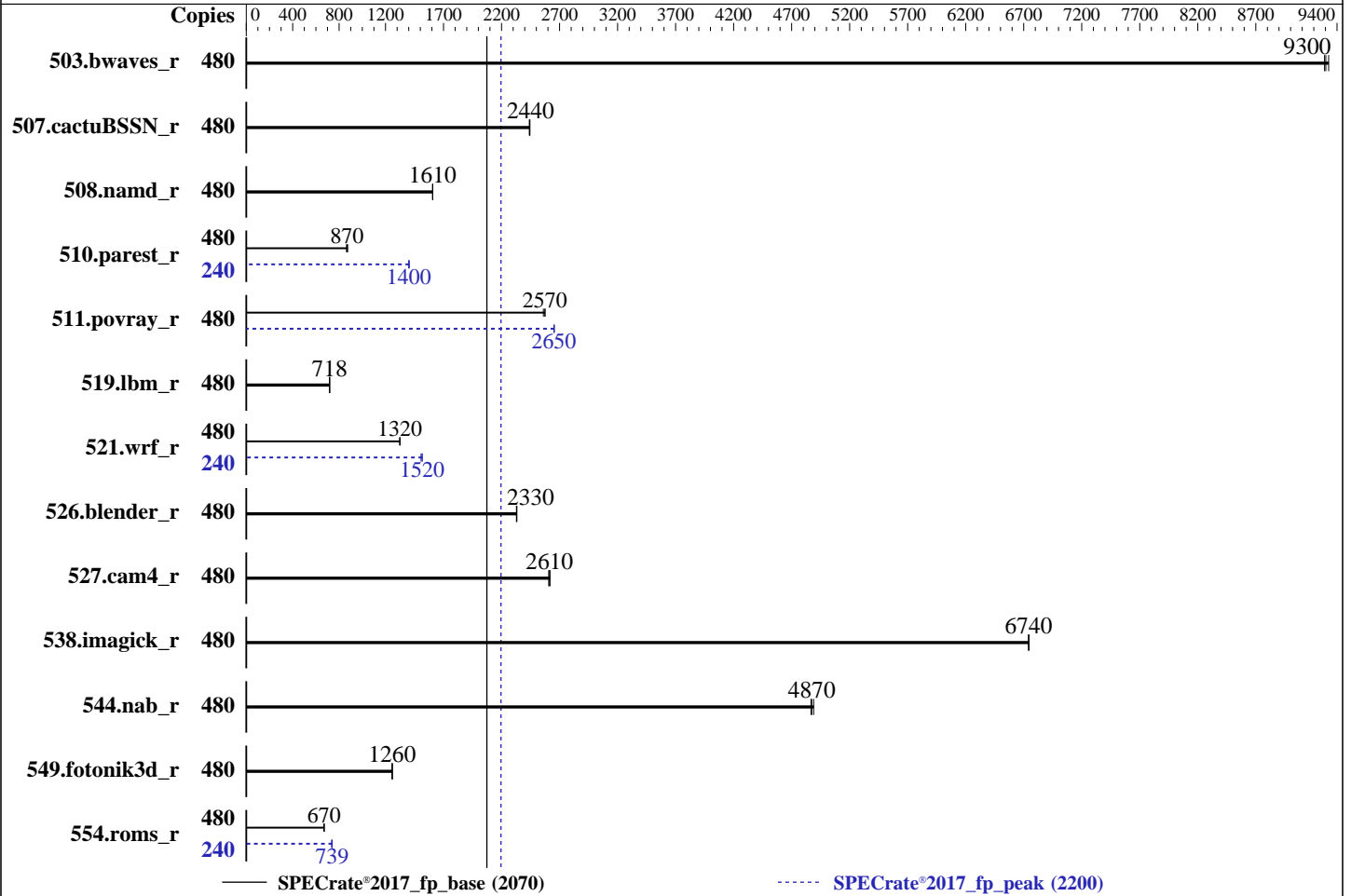
ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023



Hardware

CPU Name: Intel Xeon Platinum 8490H
Max MHz: 3500
Nominal: 1900
Enabled: 240 cores, 4 chips, 2 threads/core
Orderable: 2,4 chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 112.5 MB I+D on chip per chip
Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 960 GB SATA SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux release 9.0 (Plow)
Kernel 5.14.0-70.22.1.el9_0.x86_64
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 01.23.04.20 released Feb-2024
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	480	516	9330	<u>517</u>	<u>9300</u>	518	9290	480	516	9330	<u>517</u>	<u>9300</u>	518	9290
507.cactuBSSN_r	480	<u>249</u>	<u>2440</u>	249	2440	249	2440	480	<u>249</u>	<u>2440</u>	249	2440	249	2440
508.namd_r	480	<u>284</u>	<u>1610</u>	284	1610	284	1610	480	<u>284</u>	<u>1610</u>	284	1610	284	1610
510.parest_r	480	1454	864	<u>1444</u>	<u>870</u>	1438	873	240	448	1400	447	1400	<u>448</u>	<u>1400</u>
511.povray_r	480	435	2570	<u>435</u>	<u>2570</u>	438	2560	480	423	2650	422	2650	<u>423</u>	<u>2650</u>
519.lbm_r	480	705	718	704	718	<u>704</u>	<u>718</u>	480	705	718	704	718	<u>704</u>	<u>718</u>
521.wrf_r	480	<u>812</u>	<u>1320</u>	811	1330	813	1320	240	<u>355</u>	<u>1520</u>	355	1520	357	1510
526.blender_r	480	314	2330	314	2330	<u>314</u>	<u>2330</u>	480	314	2330	314	2330	<u>314</u>	<u>2330</u>
527.cam4_r	480	<u>321</u>	<u>2610</u>	321	2620	322	2610	480	<u>321</u>	<u>2610</u>	321	2620	322	2610
538.imagick_r	480	177	6740	177	6740	<u>177</u>	<u>6740</u>	480	177	6740	177	6740	<u>177</u>	<u>6740</u>
544.nab_r	480	166	4870	<u>166</u>	<u>4870</u>	165	4890	480	166	4870	<u>166</u>	<u>4870</u>	165	4890
549.fotonik3d_r	480	1488	1260	<u>1487</u>	<u>1260</u>	1486	1260	480	1488	1260	<u>1487</u>	<u>1260</u>	1486	1260
554.roms_r	480	1139	670	<u>1139</u>	<u>670</u>	1136	672	240	<u>516</u>	<u>739</u>	515	741	519	735

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
OS set to performance mode via cpupower frequency-set -g performance
Spectre V1 was mitigated by using "processor_speculative_off=nospectre_v1=off"
TAA mitigation was disabled by using "tsx_async_abort=off"
The kernel stops sending timer ticks to CPUs by using "nohz_full=0-479"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/spec/lib/intel64:/home/spec/je5.0.1-64"
MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

General Notes (Continued)

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
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, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

Platform Notes

BIOS Configuration:
ENERGY_PERF_BIAS_CFG mode = performance
LLC dead line alloc = Disabled
Patrol Scrub = Disabled
Intel VT for Directed I/O (VT-d) = Disabled
SR-IOV Support = Disabled
Sub NUMA(SNC) = Enable SNC4

Sysinfo program /home/spec/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Tue Feb 27 08:31:03 2024

SUT (System Under Test) info as seen by some common utilities.

Table of contents

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 250 (250-6.el9_0)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS

1. uname -a
Linux localhost.localdomain 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64
x86_64 x86_64 GNU/Linux

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
-----
2. w
 08:31:03 up 3 min,  2 users,  load average: 2.50, 4.88, 2.31
USER      TTY      LOGIN@  IDLE   JCPU   PCPU   WHAT
root      pts/0    19:56   7.00s  1.01s  0.00s  /bin/sh
./reportable-ic2023.2.3-lin-sapphirerapids-rate-smt-on-20231121.sh
root      pts/1    19:56   ?      0.00s  0.00s  -bash
```

```
-----
3. Username
From environment variable $USER:  root
```

```
-----
4. ulimit -a
real-time non-blocking time (microseconds, -R) unlimited
core file size              (blocks, -c) 0
data seg size                (kbytes, -d) unlimited
scheduling priority         (-e) 0
file size                    (blocks, -f) unlimited
pending signals              (-i) 8252983
max locked memory            (kbytes, -l) 64
max memory size              (kbytes, -m) unlimited
open files                   (-n) 1024
pipe size                    (512 bytes, -p) 8
POSIX message queues         (bytes, -q) 819200
real-time priority           (-r) 0
stack size                   (kbytes, -s) unlimited
cpu time                     (seconds, -t) unlimited
max user processes           (-u) 8252983
virtual memory                (kbytes, -v) unlimited
file locks                    (-x) unlimited
```

```
-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 28
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@pts/0
-bash
/bin/sh ./reportable-ic2023.2.3-lin-sapphirerapids-rate-smt-on-20231121.sh
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 -c
ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=240 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 --configfile
ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=240 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
--runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.028/templogs/preenv.fprate.028.0.log --lognum 028.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/spec
```

```
-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) Platinum 8490H
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 8
microcode      : 0x2b0004d0
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
bugs          : spectre_v1 spectre_v2 spec_store_bypass swappg
cpu cores     : 60
siblings      : 120
4 physical ids (chips)
480 processors (hardware threads)
physical id 0: core ids 0-59
physical id 1: core ids 0-59
physical id 2: core ids 0-59
physical id 3: core ids 0-59
physical id 0: apicids 0-119
physical id 1: apicids 128-247
physical id 2: apicids 256-375
physical id 3: apicids 384-503
```

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. lscpu

From lscpu from util-linux 2.37.4:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         46 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                480
On-line CPU(s) list:  0-479
Vendor ID:             GenuineIntel
BIOS Vendor ID:       Intel(R) Corporation
Model name:            Intel(R) Xeon(R) Platinum 8490H
BIOS Model name:      Intel(R) Xeon(R) Platinum 8490H
CPU family:            6
Model:                 143
Thread(s) per core:   2
Core(s) per socket:   60
Socket(s):             4
Stepping:              8
CPU max MHz:           3500.0000
CPU min MHz:           800.0000
BogoMIPS:              3800.00
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                      clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                      lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                      nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                      ds_cpl smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2
                      x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                      abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 invpcid_single
                      intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase
                      tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq
                      rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni
                      avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                      cqm_mbm_total cqm_mbm_local split_lock_detect avx_vnni avx512_bf16
                      wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req
                      avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq
                      avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid bus_lock_detect
                      cldemote movdiri movdir64b enqcmd fsrm md_clear serialize tsxldtrk pconfig
                      arch_lbr avx512_fp16 amx_tile flush_lld arch_capabilities
L1d cache:            11.3 MiB (240 instances)
L1i cache:            7.5 MiB (240 instances)
L2 cache:             480 MiB (240 instances)
L3 cache:             450 MiB (4 instances)
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```

NUMA node(s):                16
NUMA node0 CPU(s):           0-14,240-254
NUMA node1 CPU(s):           15-29,255-269
NUMA node2 CPU(s):           30-44,270-284
NUMA node3 CPU(s):           45-59,285-299
NUMA node4 CPU(s):           60-74,300-314
NUMA node5 CPU(s):           75-89,315-329
NUMA node6 CPU(s):           90-104,330-344
NUMA node7 CPU(s):           105-119,345-359
NUMA node8 CPU(s):           120-134,360-374
NUMA node9 CPU(s):           135-149,375-389
NUMA node10 CPU(s):          150-164,390-404
NUMA node11 CPU(s):          165-179,405-419
NUMA node12 CPU(s):          180-194,420-434
NUMA node13 CPU(s):          195-209,435-449
NUMA node14 CPU(s):          210-224,450-464
NUMA node15 CPU(s):          225-239,465-479
Vulnerability Itlb multihit: Not affected
Vulnerability Lltf:          Not affected
Vulnerability Mds:           Not affected
Vulnerability Meltdown:      Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1:     Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:     Mitigation; Enhanced IBRS, IBPB conditional, 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	48K	11.3M	12	Data	1	64	1	64
L1i	32K	7.5M	8	Instruction	1	64	1	64
L2	2M	480M	16	Unified	2	2048	1	64
L3	112.5M	450M	15	Unified	3	122880	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```

available: 16 nodes (0-15)
node 0 cpus: 0-14,240-254
node 0 size: 128088 MB
node 0 free: 127122 MB
node 1 cpus: 15-29,255-269
node 1 size: 129017 MB
node 1 free: 128460 MB
node 2 cpus: 30-44,270-284
node 2 size: 129017 MB
node 2 free: 128647 MB
node 3 cpus: 45-59,285-299
node 3 size: 129017 MB
node 3 free: 128659 MB
node 4 cpus: 60-74,300-314
node 4 size: 129017 MB
node 4 free: 128768 MB
node 5 cpus: 75-89,315-329
node 5 size: 129017 MB
node 5 free: 128786 MB
node 6 cpus: 90-104,330-344
node 6 size: 129017 MB
node 6 free: 128764 MB
node 7 cpus: 105-119,345-359

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```

node 7 size: 129017 MB
node 7 free: 128800 MB
node 8 cpus: 120-134,360-374
node 8 size: 129017 MB
node 8 free: 127251 MB
node 9 cpus: 135-149,375-389
node 9 size: 129017 MB
node 9 free: 128763 MB
node 10 cpus: 150-164,390-404
node 10 size: 129017 MB
node 10 free: 128747 MB
node 11 cpus: 165-179,405-419
node 11 size: 129017 MB
node 11 free: 127856 MB
node 12 cpus: 180-194,420-434
node 12 size: 128981 MB
node 12 free: 128685 MB
node 13 cpus: 195-209,435-449
node 13 size: 129017 MB
node 13 free: 128773 MB
node 14 cpus: 210-224,450-464
node 14 size: 129017 MB
node 14 free: 128222 MB
node 15 cpus: 225-239,465-479
node 15 size: 128988 MB
node 15 free: 128725 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
0:  10 12 12 12 21 21 21 21 21 21 21 21 21 21 21 21
1:  12 10 12 12 21 21 21 21 21 21 21 21 21 21 21 21
2:  12 12 10 12 21 21 21 21 21 21 21 21 21 21 21 21
3:  12 12 12 10 21 21 21 21 21 21 21 21 21 21 21 21
4:  21 21 21 21 10 12 12 12 21 21 21 21 21 21 21 21
5:  21 21 21 21 12 10 12 12 21 21 21 21 21 21 21 21
6:  21 21 21 21 12 12 10 12 21 21 21 21 21 21 21 21
7:  21 21 21 21 12 12 12 10 21 21 21 21 21 21 21 21
8:  21 21 21 21 21 21 21 21 10 12 12 12 21 21 21 21
9:  21 21 21 21 21 21 21 21 12 10 12 12 21 21 21 21
10: 21 21 21 21 21 21 21 21 12 12 10 12 21 21 21 21
11: 21 21 21 21 21 21 21 21 12 12 12 10 21 21 21 21
12: 21 21 21 21 21 21 21 21 21 21 21 21 10 12 12 12
13: 21 21 21 21 21 21 21 21 21 21 21 21 12 10 12 12
14: 21 21 21 21 21 21 21 21 21 21 21 21 12 12 10 12
15: 21 21 21 21 21 21 21 21 21 21 21 21 12 12 12 10

```

```

-----
9. /proc/meminfo
MemTotal:      2112805036 kB

```

```

-----
10. who -r
run-level 3 Feb 27 19:56

```

```

-----
11. Systemd service manager version: systemd 250 (250-6.el9_0)
Default Target Status
multi-user      running

```

```

-----
12. Services, from systemctl list-unit-files

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Platform Notes (Continued)

STATE	UNIT FILES
enabled	NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd systemd-network-generator udisks2
enabled-runtime	systemd-remount-fs
disabled	blk-availability chrony-wait console-getty cpupower debug-shell kvm_stat man-db-restart-cache-update nftables rdisc rhsm rhsm-facts rpmdb-rebuild serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysexct target targetclid
indirect	sssds-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

13. Linux kernel boot-time arguments, from /proc/cmdline
 BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
 root=/dev/mapper/rhel-root
 ro
 crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
 resume=/dev/mapper/rhel-swap
 rd.lvm.lv=rhel/root
 rd.lvm.lv=rhel/swap
 processor_speculative_off=nospectre_v1=off
 tsx_async_abort=off
 nohz_full=0-479

14. cpupower frequency-info
 analyzing CPU 0:
 current policy: frequency should be within 800 MHz and 3.50 GHz.
 The governor "performance" may decide which speed to use
 within this range.
 boost state support:
 Supported: yes
 Active: yes

15. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	2
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
vm.dirty_bytes	0
vm.dirty_expire_centisecs	3000
vm.dirty_ratio	20
vm.dirty_writeback_centisecs	500
vm.dirtytime_expire_seconds	43200
vm.extfrag_threshold	500
vm.min_unmapped_ratio	1
vm.nr_hugepages	0
vm.nr_hugepages_mempolicy	0
vm.nr_overcommit_hugepages	0
vm.swappiness	60
vm.watermark_boost_factor	15000
vm.watermark_scale_factor	10
vm.zone_reclaim_mode	0

16. /sys/kernel/mm/transparent_hugepage
 defrag always defer defer+madvice [madvice] never

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Platform Notes (Continued)

enabled [always] madvise never
hpage_pmd_size 2097152
shmem_enabled always within_size advise [never] deny force

17. /sys/kernel/mm/transparent_hugepage/khugepaged
alloc_sleep_millisecs 60000
defrag 1
max_ptes_none 511
max_ptes_shared 256
max_ptes_swap 64
pages_to_scan 4096
scan_sleep_millisecs 10000

18. OS release
From /etc/*-release /etc/*-version
os-release Red Hat Enterprise Linux 9.0 (Plow)
redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
system-release Red Hat Enterprise Linux release 9.0 (Plow)

19. Disk information
SPEC is set to: /home/spec
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 819G 426G 394G 52% /home

20. /sys/devices/virtual/dmi/id
Vendor: ZTE
Product: R8500 G5
Product Family: Server
Serial: 219413636851

21. dmidecode
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:
32x Samsung M321R8GA0BB0-CQKMG 64 GB 2 rank 4800

22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: American Megatrends Inc.
BIOS Version: 01.23.04.20
BIOS Date: 02/27/2024
BIOS Revision: 1.23

Compiler Version Notes

C | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation
ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070
SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Compiler Version Notes (Continued)

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.

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

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.

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

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

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_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
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:

-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Base Optimization Flags (Continued)

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both Fortran and C:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:

```
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061
Test Sponsor: ZTE Corporation
Tested by: ZTE Corporation

Test Date: Feb-2024
Hardware Availability: Feb-2023
Software Availability: Dec-2023

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:

521.wrf_r: -w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

527.cam4_r: basepeak = yes

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 2070

SPECrate®2017_fp_peak = 2200

CPU2017 License: 9061

Test Sponsor: ZTE Corporation

Tested by: ZTE Corporation

Test Date: Feb-2024

Hardware Availability: Feb-2023

Software Availability: Dec-2023

Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

```
511.povray_r: -w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int
-mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

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

<http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.html>

<http://www.spec.org/cpu2017/flags/ZTE-Platform-Settings-SPR-V1.9.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml>

<http://www.spec.org/cpu2017/flags/ZTE-Platform-Settings-SPR-V1.9.xml>

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.9 on 2024-02-27 08:31:03-0500.

Report generated on 2024-04-24 14:31:20 by CPU2017 PDF formatter v6716.

Originally published on 2024-04-24.