SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation
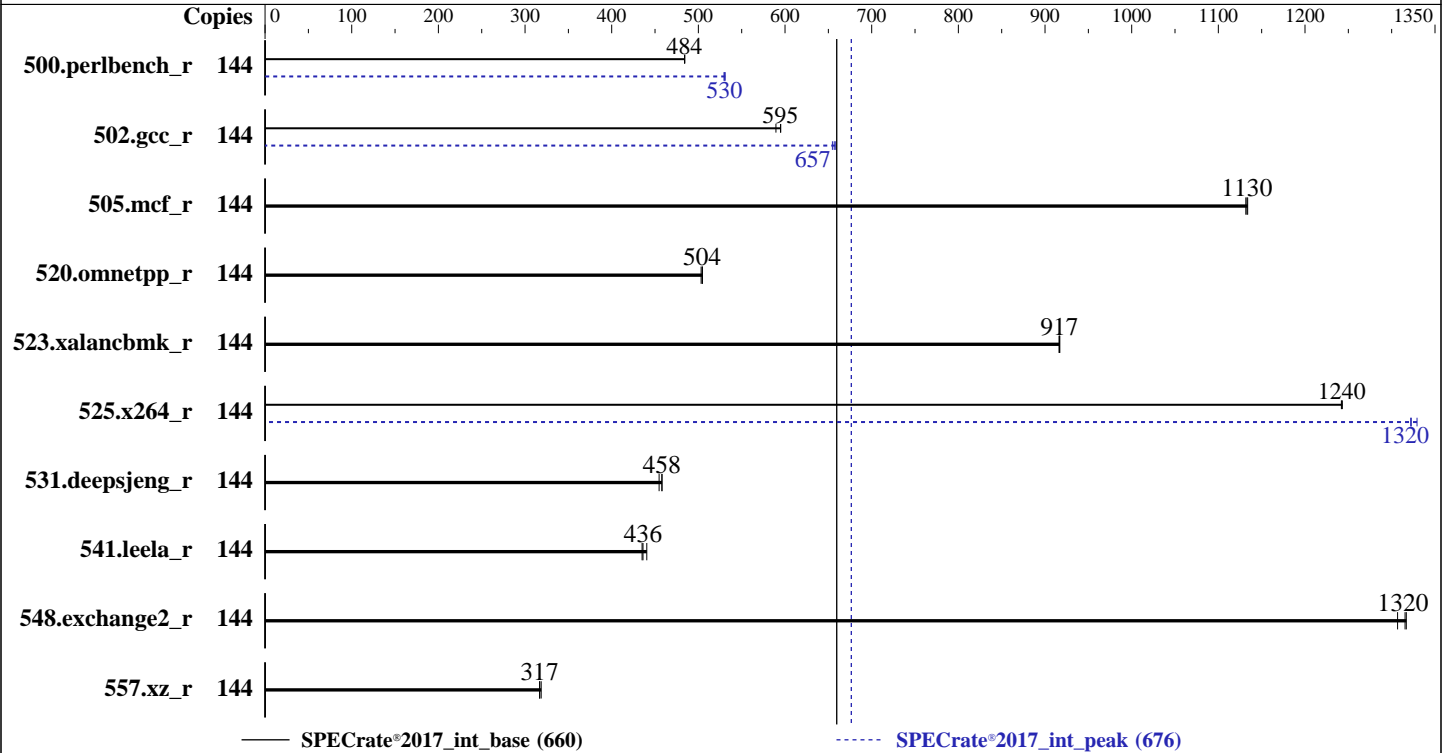
ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

$SPECrate^{®}2017\_int\_base = 660$

$SPECrate^{®}2017\_int\_peak = 676$

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Copies		
500.perlbench_r	144	484 / 530
502.gcc_r	144	595 / 657
505.mcf_r	144	1130
520.omnetpp_r	144	504
523.xalancbmk_r	144	917
525.x264_r	144	1240 / 1320
531.deepsjeng_r	144	458
541.leela_r	144	436
548.exchange2_r	144	1320
557.xz_r	144	317

SPECrate®2017_int_base (660)   SPECrate®2017_int_peak (676)

Hardware

CPU Name: Intel Xeon Gold 6416H
 Max MHz: 4200
 Nominal: 2200
Enabled: 72 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: 45 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 9.0 (Plow)
 5.14.0-70.13.1.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: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	144	474	484	**474**	**484**	473	484	144	432	531	**433**	**530**	433	530
502.gcc_r	144	**343**	**595**	346	589	343	595	144	311	655	**311**	**657**	310	658
505.mcf_r	144	**205**	**1130**	205	1130	206	1130	144	**205**	**1130**	205	1130	206	1130
520.omnetpp_r	144	**375**	**504**	374	505	375	503	144	**375**	**504**	374	505	375	503
523.xalancbmk_r	144	166	917	166	916	**166**	**917**	144	166	917	166	916	**166**	**917**
525.x264_r	144	**203**	**1240**	203	1240	203	1240	144	191	1320	**191**	**1320**	190	1330
531.deepsjeng_r	144	**360**	**458**	360	458	363	455	144	**360**	**458**	360	458	363	455
541.leela_r	144	541	440	**547**	**436**	548	435	144	541	440	**547**	**436**	548	435
548.exchange2_r	144	286	1320	**287**	**1320**	289	1310	144	286	1320	**287**	**1320**	289	1310
557.xz_r	144	**491**	**317**	488	319	491	317	144	**491**	**317**	488	319	491	317
SPECrate®2017_int_base =		**660**												
SPECrate®2017_int_peak =		**676**												

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
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/spec2017/lib/intel64:/home/spec2017/lib/ia32:/home/spec2017/je5.0.1-32"
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
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)
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

General Notes (Continued)

```
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 SNC2

Sysinfo program /home/spec2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Fri May 24 15:42:58 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 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64
   x86_64 x86_64 GNU/Linux

-------------------------------------------------------------
2. w
    15:42:58 up 19 min,  3 users,  load average: 0.15, 0.04, 0.05
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0      15:32    8.00s  0.81s  0.00s /bin/sh
   ./reportable-ic2023.2.3-lin-sapphirerapids-rate-smt-on-20231121.sh
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
   root     pts/1    15:32   10:31   0.00s  0.00s -bash
   root     pts/2    15:39    3:58   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) 8253303
    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) 8253303
    virtual memory              (kbytes, -v) unlimited
    file locks                      (-x) unlimited


  ----------------------------------------------------------
  5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 27
   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=144 -c
     ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=72 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base,peak -o all intrate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=144 --configfile
     ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=72 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
     --runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
     $SPEC/tmp/CPU2017.014/templogs/preenv.intrate.014.0.log --lognum 014.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/spec2017


  ----------------------------------------------------------
  6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) Gold 6416H
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b0004d0
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores       : 18
    siblings        : 36
    4 physical ids (chips)
    144 processors (hardware threads)
    physical id 0: core ids 0-17
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

CPU2017 License: 9061

Test Sponsor: ZTE Corporation

Tested by: ZTE Corporation

Test Date: May-2024

Hardware Availability: Apr-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```
    physical id 1: core ids 0-17
    physical id 2: core ids 0-17
    physical id 3: core ids 0-17
    physical id 0: apicids 0-35
    physical id 1: apicids 128-163
    physical id 2: apicids 256-291
    physical id 3: apicids 384-419
  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):                 144
    On-line CPU(s) list:    0-143
    Vendor ID:              GenuineIntel
    BIOS Vendor ID:         Intel(R) Corporation
    Model name:             Intel(R) Xeon(R) Gold 6416H
    BIOS Model name:        Intel(R) Xeon(R) Gold 6416H
    CPU family:             6
    Model:                  143
    Thread(s) per core:     2
    Core(s) per socket:     18
    Socket(s):              4
    Stepping:               8
    CPU max MHz:            4200.0000
    CPU min MHz:            800.0000
    BogoMIPS:              4400.00
    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_l1d arch_capabilities
    L1d cache:              3.4 MiB (72 instances)
    L1i cache:              2.3 MiB (72 instances)
    L2 cache:               144 MiB (72 instances)
    L3 cache:               180 MiB (4 instances)
    NUMA node(s):           8
    NUMA node0 CPU(s):      0-8,72-80
    NUMA node1 CPU(s):      9-17,81-89
    NUMA node2 CPU(s):      18-26,90-98
    NUMA node3 CPU(s):      27-35,99-107
    NUMA node4 CPU(s):      36-44,108-116
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
  NUMA node5 CPU(s):             45-53,117-125
  NUMA node6 CPU(s):             54-62,126-134
  NUMA node7 CPU(s):             63-71,135-143
  Vulnerability Itlb multihit:   Not affected
  Vulnerability L1tf:            Not affected
  Vulnerability Mds:             Not affected
  Vulnerability Meltdown:        Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
  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     3.4M   12 Data          1     64      1           64
      L1i      32K     2.3M    8 Instruction   1     64      1           64
      L2        2M     144M   16 Unified       2   2048      1           64
      L3       45M     180M   15 Unified       3  49152      1           64


  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-8,72-80
    node 0 size: 257114 MB
    node 0 free: 256606 MB
    node 1 cpus: 9-17,81-89
    node 1 size: 258043 MB
    node 1 free: 257725 MB
    node 2 cpus: 18-26,90-98
    node 2 size: 258043 MB
    node 2 free: 257718 MB
    node 3 cpus: 27-35,99-107
    node 3 size: 258043 MB
    node 3 free: 257722 MB
    node 4 cpus: 36-44,108-116
    node 4 size: 258043 MB
    node 4 free: 257619 MB
    node 5 cpus: 45-53,117-125
    node 5 size: 258043 MB
    node 5 free: 257118 MB
    node 6 cpus: 54-62,126-134
    node 6 size: 258043 MB
    node 6 free: 257208 MB
    node 7 cpus: 63-71,135-143
    node 7 size: 257987 MB
    node 7 free: 257174 MB
    node distances:
    node   0   1   2   3   4   5   6   7
      0:  10  12  21  21  21  21  21  21
      1:  12  10  21  21  21  21  21  21
      2:  21  21  10  12  21  21  21  21
      3:  21  21  12  10  21  21  21  21
      4:  21  21  21  21  10  12  21  21
      5:  21  21  21  21  12  10  21  21
      6:  21  21  21  21  21  21  10  12
      7:  21  21  21  21  21  21  12  10


  ------------------------------------------------------------
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
 9. /proc/meminfo
    MemTotal:       2112886924 kB


   ----------------------------------------------------------
10. who -r
   run-level 3 May 24 15:24


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


   ----------------------------------------------------------
12. Services, from systemctl list-unit-files
    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         arp-ethers 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-sysext target
                     targetclid
    indirect         sssd-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-5.14.0-70.13.1.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
   nohz_full=0-143


   ----------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 800 MHz and 4.20 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
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
   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+madvise [madvise] never
   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/spec2017
   Filesystem             Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   819G  135G  684G  17% /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.
```

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

CPU2017 License: 9061

Test Sponsor: ZTE Corporation

Tested by: ZTE Corporation

Test Date: May-2024

Hardware Availability: Apr-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```
        BIOS Version:       01.23.04.20
        BIOS Date:          02/27/2024
        BIOS Revision:      1.23
```

Compiler Version Notes

```
==============================================================================================
C       | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_r(base, peak)
----------------------------------------------------------------------------------------------
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       | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_r(base, peak)
----------------------------------------------------------------------------------------------
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++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
        | 541.leela_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.
----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 548.exchange2_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.
----------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

icx

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Base Compiler Invocation (Continued)

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Base Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
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:
`-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

C++ benchmarks:
`-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math`
`-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

Fortran benchmarks:
`-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-nostandard-realloc-lhs -align array32byte -auto`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

CPU2017 License: 9061	**Test Date:** May-2024
Test Sponsor: ZTE Corporation	**Hardware Availability:** Apr-2023
Tested by: ZTE Corporation	**Software Availability:** Dec-2023

Peak Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Peak Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
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`

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `-w -std=c11 -m64 -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`
`-fno-strict-overflow`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

502.gcc_r: `-m32`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/ia32_lin`
`-std=gnu89 -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`
`-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc`

(Continued on next page)

ZTE Corporation

ZTE R8500G5 Server System
(2.20 GHz, Intel Xeon Gold 6416H)

SPECrate®2017_int_base = 660

SPECrate®2017_int_peak = 676

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

Test Date: May-2024
Hardware Availability: Apr-2023
Software Availability: Dec-2023

Peak Optimization Flags (Continued)

505.mcf_r: `basepeak = yes`

525.x264_r: `-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -fno-alias`
`-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin`
`-lqkmalloc`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

Fortran benchmarks:

548.exchange2_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-V1.11.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-V1.11.xml

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 2024-05-24 15:42:58-0400.
Report generated on 2024-06-26 12:28:41 by CPU2017 PDF formatter v6716.
Originally published on 2024-06-25.