



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_int\_base = 460

PowerEdge R760 (Intel Xeon Gold 5420+)

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 6573

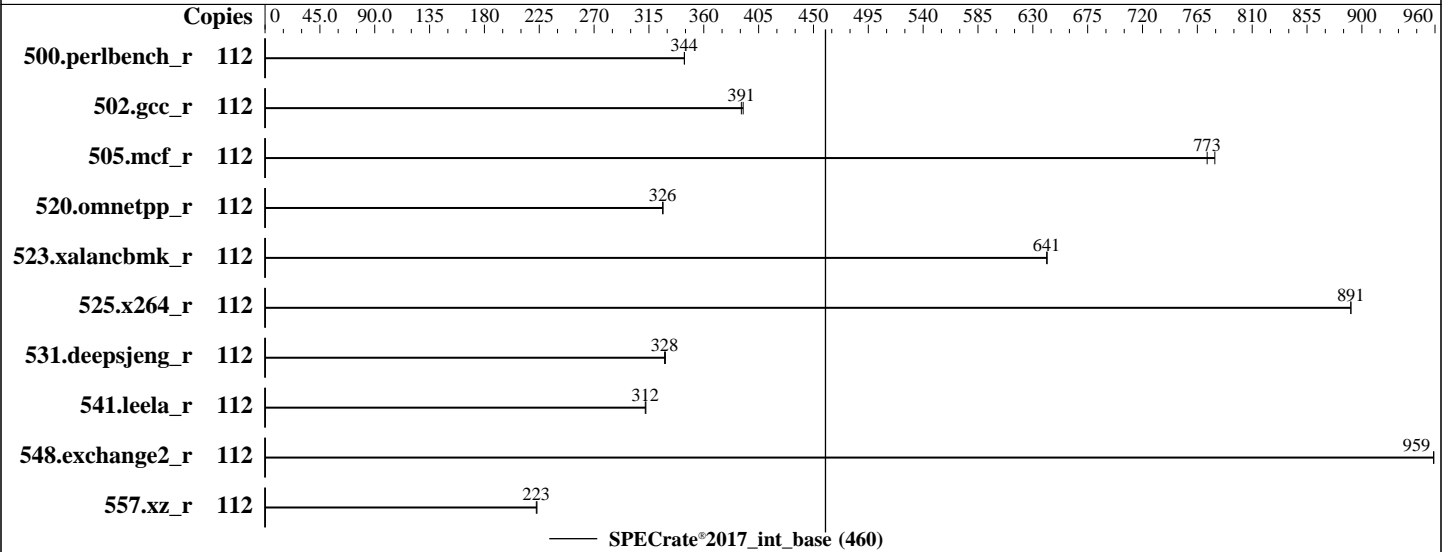
Test Date: Apr-2024

Test Sponsor: Dell Inc.

Hardware Availability: Apr-2023

Tested by: Dell Inc.

Software Availability: Dec-2023



### Hardware

CPU Name: Intel Xeon Gold 5420+  
 Max MHz: 4100  
 Nominal: 2000  
 Enabled: 56 cores, 2 chips, 2 threads/core  
 Orderable: 1,2 chips  
 Cache L1: 32 KB I + 48 KB D on chip per core  
 L2: 2 MB I+D on chip per core  
 L3: 52.5 MB I+D on chip per chip  
 Other: None  
 Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)  
 Storage: 80 GB on tmpfs  
 Other: CPU Cooling: Air

### Software

OS: SUSE Linux Enterprise Server 15 SP4  
 5.14.21-150400.24.81-default  
 Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux;  
 Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;  
 Parallel: No  
 Firmware: Version 2.1.5 released Mar-2024  
 File System: tmpfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 Other: None  
 Power Management: BIOS and 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	112	<b>518</b>	<b>344</b>	518	344									
502.gcc_r	112	404	392	<b>406</b>	<b>391</b>									
505.mcf_r	112	232	779	<b>234</b>	<b>773</b>									
520.omnetpp_r	112	<b>450</b>	<b>326</b>	450	327									
523.xalancbmk_r	112	184	642	<b>184</b>	<b>641</b>									
525.x264_r	112	220	891	<b>220</b>	<b>891</b>									
531.deepsjeng_r	112	391	328	<b>392</b>	<b>328</b>									
541.leela_r	112	<b>595</b>	<b>312</b>	594	312									
548.exchange2_r	112	<b>306</b>	<b>959</b>	306	959									
557.xz_r	112	542	223	<b>543</b>	<b>223</b>									

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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"

## Environment Variables Notes

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

```
LD_LIBRARY_PATH =
"/mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/lib/ia32:/mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/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)

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## General Notes (Continued)

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.

Benchmark run from a 80 GB ramdisk created with the cmd: "mount -t tmpfs -o size=80G tmpfs /mnt/ramdisk"

## Platform Notes

BIOS settings:

```

      ADDDC Setting : Disabled
      DIMM Self Healing on
      Uncorrectable Memory Error : Disabled

      Virtualization Technology : Disabled
      DCU Streamer Prefetcher : Disabled
      Sub NUMA Cluster : 2-way Clustering
      LLC Prefetch : Disabled
      Dead Line LLC Alloc : Disabled
      Optimizer Mode : Enabled

      System Profile : Custom
      CPU Power Management : Maximum Performance
      C1E : Disabled
      C States : Autonomous
      Memory Patrol Scrub : Disabled
      Energy Efficiency Policy : Performance
      PCI ASPM L1 Link
      Power Management : Disabled

```

```

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on sut Thu Apr 11 00:22:05 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 249 (249.16+suse.195.gb473c02cc0)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. tuned-adm active
17. systemctl
18. /sys/kernel/mm/transparent\_hugepage
19. /sys/kernel/mm/transparent\_hugepage/khugepaged
20. OS release

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## Platform Notes (Continued)

- 21. Disk information
- 22. /sys/devices/virtual/dmi/id
- 23. dmidecode
- 24. BIOS

```
1. uname -a
Linux sut 5.14.21-150400.24.81-default #1 SMP PREEMPT_DYNAMIC Tue Aug 8 14:10:43 UTC 2023 (90a74a8) x86_64
x86_64 x86_64 GNU/Linux
```

```
2. w
00:22:05 up 1 min, 1 user, load average: 0.69, 0.28, 0.11
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root     tty1    -                00:21   37.00s 1.12s  0.01s /bin/bash
/home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define
DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt --define
DL-LQC=1 --tune base
```

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

```
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size          (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals        (-i) 4126041
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) 4126041
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
```

```
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
/bin/bash ./DELL_rate.sh --tune base
/bin/bash /home/DellFiles/bin/dell-run-main.sh rate --tune base
/bin/bash /home/DellFiles/bin/dell-run-main.sh rate --tune base
/bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc
--define DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt
--define DL-LQC=1 --tune base
/bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc
--define DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt
--define DL-LQC=1 --tune base
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 -c
ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=56 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak -o all --define DL-BIOS-SNC=2
```

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## Platform Notes (Continued)

```
--iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1 --define
DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt --define DL-LQC=1 --tune base intrate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 --configfile
ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=56 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --define
DL-BIOS-SNC=2 --iterations 2 --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-LogProc=1 --define
DL-BIOS-adddcD=1 --define DL-VERS=5.0 --output_format html,pdf,txt --define DL-LQC=1 --tune base --nopower
--runmode rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.001/temlogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2
```

```
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) Gold 5420+
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 7
microcode      : 0x2b000571
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
cpu cores      : 28
siblings       : 56
2 physical ids (chips)
112 processors (hardware threads)
physical id 0: core ids 0-27
physical id 1: core ids 0-27
physical id 0: apicids 0-55
physical id 1: apicids 128-183
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 2.37.2:
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):                112
On-line CPU(s) list:   0-111
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Gold 5420+
CPU family:            6
Model:                 143
Thread(s) per core:    2
Core(s) per socket:    28
Socket(s):             2
Stepping:              7
CPU max MHz:           4100.0000
CPU min MHz:           800.0000
BogoMIPS:              4000.00
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 pdpelt
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
```

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### Platform Notes (Continued)

cdp\_l3 invpcid\_single cdp\_l2 ssbd mba ibrs ibpb stibp ibrs\_enhanced  
fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm 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 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 fstrm md\_clear serialize tsxldtrk pconfig  
arch\_lbr avx512\_fp16 amx\_tile flush\_lld arch\_capabilities

L1d cache: 2.6 MiB (56 instances)  
L1i cache: 1.8 MiB (56 instances)  
L2 cache: 112 MiB (56 instances)  
L3 cache: 105 MiB (2 instances)  
NUMA node(s): 4  
NUMA node0 CPU(s): 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108  
NUMA node1 CPU(s): 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 66, 70, 74, 78, 82, 86, 90, 94, 98, 102, 106, 110  
NUMA node2 CPU(s): 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69, 73, 77, 81, 85, 89, 93, 97, 101, 105, 111  
NUMA node3 CPU(s): 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 55, 59, 63, 67, 71, 75, 79, 83, 87, 91, 95, 99, 103, 107, 111  
Vulnerability Gather data sampling: Not affected  
Vulnerability Itlb multihit: Not affected  
Vulnerability L1tf: Not affected  
Vulnerability Mds: Not affected  
Vulnerability Meltdown: Not affected  
Vulnerability Mmio stale data: Not affected  
Vulnerability Retbleed: Not affected  
Vulnerability Spec rstack overflow: Not affected  
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp  
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and \_\_user pointer sanitization  
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSE-eIBRS  
SW sequence  
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	2.6M	12	Data	1	64	1	64
L1i	32K	1.8M	8	Instruction	1	64	1	64
L2	2M	112M	16	Unified	2	2048	1	64
L3	52.5M	105M	15	Unified	3	57344	1	64

8. numactl --hardware

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

available: 4 nodes (0-3)  
node 0 cpus: 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108  
node 0 size: 257493 MB  
node 0 free: 254166 MB  
node 1 cpus: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 66, 70, 74, 78, 82, 86, 90, 94, 98, 102, 106, 110  
node 1 size: 258040 MB  
node 1 free: 248727 MB  
node 2 cpus: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69, 73, 77, 81, 85, 89, 93, 97, 101, 105, 111  
node 2 size: 257994 MB  
node 2 free: 257443 MB  
node 3 cpus: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 55, 59, 63, 67, 71, 75, 79, 83, 87, 91, 95, 99, 103, 107, 109  
node 3 size: 258011 MB

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## Platform Notes (Continued)

```
node 3 free: 257415 MB
node distances:
node 0 1 2 3
0: 10 12 21 21
1: 12 10 21 21
2: 21 21 10 12
3: 21 21 12 10
```

```
-----
9. /proc/meminfo
MemTotal: 1056296536 kB
```

```
-----
10. who -r
run-level 3 Apr 11 00:20
```

```
-----
11. Systemd service manager version: systemd 249 (249.16+suse.195.gb473c02cc0)
Default Target Status
multi-user degraded
```

```
-----
12. Failed units, from systemctl list-units --state=failed
UNIT LOAD ACTIVE SUB DESCRIPTION
* postfix.service loaded failed failed Postfix Mail Transport Agent
* smartd.service loaded failed failed Self Monitoring and Reporting Technology (SMART) Daemon
```

```
-----
13. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
YaST2-Firstboot YaST2-Second-Stage auditd bluetooth cron display-manager getty@ havedged
irqbalance iscsi issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels
rollback rsyslog smartd sshd systemd-pstore tuned wpa_supplicant
enabled-runtime systemd-remount-fs
disabled accounts-daemon apparmor appstream-sync-cache autofs autoyast-initscripts blk-availability
bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups
cups-browsed debug-shell dmraid-activation dnsmasq ebttables exchange-bmc-os-info
fancontrol firewalld gpm grub2-once havedged-switch-root hwloc-dump-hwdata ipmi ipmievd
iscsi-init iscsid iscsiio issue-add-ssh-keys kexec-load lm_sensors lunmask man-db-create
multipathd ndctl-monitor nfs nfs-blkmap nfs-server nfsserver nm-cloud-setup nmb
ostree-remount power-profiles-daemon rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon
serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd svnserve
systemd-boot-check-no-failures systemd-network-generator systemd-sysext
systemd-time-wait-sync systemd-timesyncd udisks2 upower wicked wickedd-auto4 wickedd-dhcp4
wickedd-dhcp6 wickedd-nanny wpa_supplicant@
indirect pcsd wickedd
```

```
-----
14. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.24.81-default
root=UUID=1370a640-700c-4b25-a152-2c5f9290f614
splash=silent
mitigations=auto
quiet
security=apparmorpcie_aspm=force
pcie_aspm.policy=powersave
intel_pstate=passive
```

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## Platform Notes (Continued)

```

15. cpupower frequency-info
    analyzing CPU 0:
        current policy: frequency should be within 800 MHz and 4.10 GHz.
                        The governor "ondemand" may decide which speed to use
                        within this range.
    boost state support:
        Supported: yes
        Active: yes

```

```

-----
16. tuned-adm active
    It seems that tuned daemon is not running, preset profile is not activated.
    Preset profile: throughput-performance

```

```

-----
17. 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

```

```

-----
18. /sys/kernel/mm/transparent_hugepage
defrag          always defer+madvise [madvise] never
enabled        [always] madvise never
hpage_pmd_size 2097152
shmem_enabled  always within_size advise [never] deny force

```

```

-----
19. /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

```

```

-----
20. OS release
    From /etc/*-release /etc/*-version
    os-release SUSE Linux Enterprise Server 15 SP4

```

```

-----
21. Disk information

```

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## Platform Notes (Continued)

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2024.0.2  
Filesystem Type Size Used Avail Use% Mounted on  
tmpfs tmpfs 80G 5.7G 75G 8% /mnt/ramdisk

-----  
22. /sys/devices/virtual/dmi/id  
Vendor: Dell Inc.  
Product: PowerEdge R760  
Product Family: PowerEdge  
Serial: SLR7604

-----  
23. dmidecode  
Additional information from dmidecode 3.4 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:  
2x 00CE00B300CE M321R8GA0BB0-CQKEG 64 GB 2 rank 4800, configured at 4400  
14x 00CE069D00CE M321R8GA0BB0-CQKVG 64 GB 2 rank 4800, configured at 4400

-----  
24. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: Dell Inc.  
BIOS Version: 2.1.5  
BIOS Date: 03/14/2024  
BIOS Revision: 2.1

## Compiler Version Notes

=====  
C | 500.perlbench\_r(base) 502.gcc\_r(base) 505.mcf\_r(base) 525.x264\_r(base) 557.xz\_r(base)

-----  
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213  
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=====  
C++ | 520.omnetpp\_r(base) 523.xalancbmk\_r(base) 531.deepsjeng\_r(base) 541.leela\_r(base)

-----  
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213  
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=====  
Fortran | 548.exchange2\_r(base)

-----  
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213  
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# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_int\_base = 460

PowerEdge R760 (Intel Xeon Gold 5420+)

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 6573  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

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

## Base Compiler Invocation

C benchmarks:

icx

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/opt/intel/oneapi/compiler/2024.0/lib -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/opt/intel/oneapi/compiler/2024.0/lib -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/opt/intel/oneapi/compiler/2024.0/lib -lqkmalloc
```



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Hardware Availability: Apr-2023

Software Availability: Dec-2023

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

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.6.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.9 on 2024-04-11 01:22:05-0400.

Report generated on 2024-05-21 19:23:12 by CPU2017 PDF formatter v6716.

Originally published on 2024-05-21.