



SPEC CPU®2017 Integer Rate Result

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Dell Inc.

SPECrate®2017_int_base = 1180

PowerEdge R960 (Intel Xeon Gold 6448H)

SPECrate®2017_int_peak = 1220

CPU2017 License: 6573

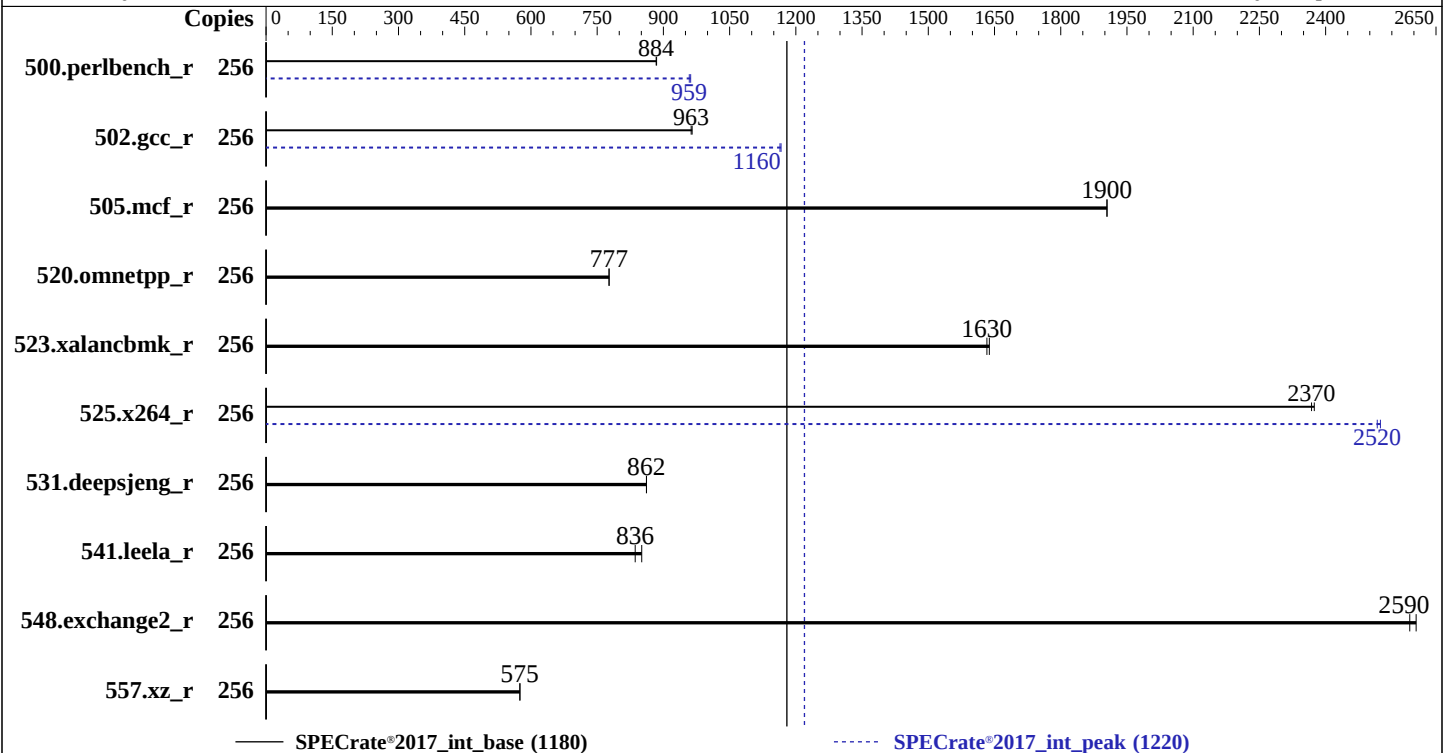
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2025

Hardware Availability: Mar-2025

Software Availability: Apr-2025



Hardware

CPU Name: Intel Xeon Gold 6448H
Max MHz: 4100
Nominal: 2400
Enabled: 128 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: 60 MB I+D on chip per chip
Other: None
Memory: 1 TB (32 x 32 GB 2Rx8 PC5-5600B-R, running at 4800)
Storage: 140 GB on tmpfs
Other: CPU Cooling: DLC

Software

OS: Red Hat Enterprise Linux 9.5 (Plow)
5.14.0-503.38.1.el9_5.x86_64
Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 2.7.5 released Jul-2025
File System: tmpfs
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.



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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	256	461	885	<u>461</u>	<u>884</u>			256	424	962	<u>425</u>	<u>959</u>		
502.gcc_r	256	376	965	<u>376</u>	<u>963</u>			256	311	1170	<u>311</u>	<u>1160</u>		
505.mcf_r	256	<u>217</u>	<u>1900</u>	217	1910			256	<u>217</u>	<u>1900</u>	217	1910		
520.omnetpp_r	256	<u>432</u>	<u>777</u>	432	777			256	<u>432</u>	<u>777</u>	432	777		
523.xalancbmk_r	256	<u>166</u>	<u>1630</u>	165	1640			256	<u>166</u>	<u>1630</u>	165	1640		
525.x264_r	256	<u>189</u>	<u>2370</u>	189	2370			256	<u>178</u>	<u>2520</u>	178	2520		
531.deepsjeng_r	256	<u>341</u>	<u>862</u>	340	862			256	<u>341</u>	<u>862</u>	340	862		
541.leela_r	256	498	851	<u>507</u>	<u>836</u>			256	498	851	<u>507</u>	<u>836</u>		
548.exchange2_r	256	<u>259</u>	<u>2590</u>	257	2600			256	<u>259</u>	<u>2590</u>	257	2600		
557.xz_r	256	<u>481</u>	<u>575</u>	481	575			256	<u>481</u>	<u>575</u>	481	575		

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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-ic2024.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2024.1/lib/ia32:/mnt/ramdisk/cpu2017-1.1.9-ic2024.1/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>
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>

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General Notes (Continued)

Benchmark run from a 140 GB ramdisk created with the cmd: "mount -t tmpfs -o size=140G tmpfs /mnt/ramdisk"

Platform Notes

BIOS Settings:

DCU Streamer Prefetcher : Disabled
Sub NUMA Cluster : 2-Way Clustering
UMA Based Clustering Status : Disable
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 Efficient Policy : Performance
PCI ASPM L1 Link Power Management : Disabled
DIMM Self Healing -
on Uncorrectable Memory Error : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2024.1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on SLR9601-R960 Thu Oct 23 10:47:58 2025

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

Table of contents

1. uname -a
2. w
3. Username
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5. sysinfo process ancestry
6. /proc/cpuinfo
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9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 252 (252-46.el9_5.3)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

1. uname -a
Linux SLR9601-R960 5.14.0-503.38.1.el9_5.x86_64 #1 SMP PREEMPT_DYNAMIC Sun Apr 13 22:01:49 EDT 2025 x86_64

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Platform Notes (Continued)

x86_64 x86_64 GNU/Linux

2. w

10:47:58 up 11 min, 1 user, load average: 0.31, 0.08, 0.02

USER TTY LOGIN@ IDLE JCPU PCPU WHAT

root tty1 10:37 46.00s 0.86s 0.01s /bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh

rate --define DL-VERS=6.3b --output_format html,pdf,txt

3. Username

From environment variable \$USER: root

4. ulimit -a

real-time non-blocking time (microseconds, -R) unlimited

core file size (blocks, -c) unlimited

data seg size (kbytes, -d) unlimited

scheduling priority (-e) 0

file size (blocks, -f) unlimited

pending signals (-i) 4123622

max locked memory (kbytes, -l) 8192

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) 4123622

virtual memory (kbytes, -v) unlimited

file locks (-x) unlimited

5. sysinfo process ancestry

/usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31

login -- root

-bash

/bin/bash /home/DellFiles/bin/DELL_rate.sh

/bin/bash /home/DellFiles/bin/dell-run-main.sh rate

/bin/bash /home/DellFiles/bin/dell-run-main.sh rate

/bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-VERS=6.3b --output_format html,pdf,txt

/bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-VERS=6.3b --output_format html,pdf,txt

runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 -c

ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=128 --define physicalfirst

--define invoke_with_interleave --define drop_caches --tune base,peak -o all --iterations 2 --define

DL-VERS=6.3b --output_format html,pdf,txt intrate

runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 --configfile

ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=128 --define physicalfirst

--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --iterations 2

--define DL-VERS=6.3b --output_format html,pdf,txt --nopower --runmode rate --tune base:peak --size

refrate intrate --nopreenv --note-preenv --logfile \$SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log

--lognum 001.0 --from_runcpu 2

specperl \$SPEC/bin/sysinfo

\$SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2024.1

6. /proc/cpuinfo

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Platform Notes (Continued)

model name : Intel(R) Xeon(R) Gold 6448H
vendor_id : GenuineIntel
cpu family : 6
model : 143
stepping : 7
microcode : 0x2b000643
bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb bhi
cpu cores : 32
siblings : 64
4 physical ids (chips)
256 processors (hardware threads)
physical id 0: core ids 0-31
physical id 1: core ids 0-31
physical id 2: core ids 0-31
physical id 3: core ids 0-31
physical id 0: apicids 0-63
physical id 1: apicids 128-191
physical id 2: apicids 256-319
physical id 3: apicids 384-447

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): 256
On-line CPU(s) list: 0-255
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel
Model name: Intel(R) Xeon(R) Gold 6448H
BIOS Model name: Intel(R) Xeon(R) Gold 6448H
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 4
Stepping: 7
CPU(s) scaling MHz: 100%
CPU max MHz: 4100.0000
CPU min MHz: 800.0000
BogoMIPS: 4800.00
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 vmx 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 cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept vpid ept_ad 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 hfi vnni

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Platform Notes (Continued)

avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes vpcmlulqddq
avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid
bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear
serialize tsxldtrk pconfig arch_lbr ibt amx_bf16 avx512_fp16 amx_tile
amx_int8 flush_l1d arch_capabilities

Virtualization:

L1d cache:

L1i cache:

L2 cache:

L3 cache:

NUMA node(s):

NUMA node0 CPU(s):

NUMA node1 CPU(s):

NUMA node2 CPU(s):

NUMA node3 CPU(s):

NUMA node4 CPU(s):

NUMA node5 CPU(s):

NUMA node6 CPU(s):

NUMA node7 CPU(s):

Vulnerability Gather data sampling:

Vulnerability Itlb multihit:

Vulnerability L1tf:

Vulnerability Mds:

Vulnerability Meltdown:

Vulnerability Mmio stale data:

Vulnerability Reg file data sampling:

Vulnerability Retbleed:

Vulnerability Spec rstack overflow:

Vulnerability Spec store bypass:

Vulnerability Spectre v1:

Vulnerability Spectre v2:

Vulnerability Srbds:

Vulnerability Tsx async abort:

VT-x

6 MiB (128 instances)

4 MiB (128 instances)

256 MiB (128 instances)

240 MiB (4 instances)

8

0, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232, 240, 248

4, 12, 20, 28, 36, 44, 52, 60, 68, 76, 84, 92, 100, 108, 116, 124, 132, 140, 148, 156, 164, 172, 180, 188, 196, 204, 212, 220, 228, 236, 244, 252

1, 9, 17, 25, 33, 41, 49, 57, 65, 73, 81, 89, 97, 105, 113, 121, 129, 137, 145, 153, 161, 169, 177, 185, 193, 201, 209, 217, 225, 233, 241, 249

5, 13, 21, 29, 37, 45, 53, 61, 69, 77, 85, 93, 101, 109, 117, 125, 133, 141, 149, 157, 165, 173, 181, 189, 197, 205, 213, 221, 229, 237, 245, 253

2, 10, 18, 26, 34, 42, 50, 58, 66, 74, 82, 90, 98, 106, 114, 122, 130, 138, 146, 154, 162, 170, 178, 186, 194, 202, 210, 218, 226, 234, 242, 250

6, 14, 22, 30, 38, 46, 54, 62, 70, 78, 86, 94, 102, 110, 118, 126, 134, 142, 150, 158, 166, 174, 182, 190, 198, 206, 214, 222, 230, 238, 246, 254

3, 11, 19, 27, 35, 43, 51, 59, 67, 75, 83, 91, 99, 107, 115, 123, 131, 139, 147, 155, 163, 171, 179, 187, 195, 203, 211, 219, 227, 235, 243, 251

7, 15, 23, 31, 39, 47, 55, 63, 71, 79, 87, 95, 103, 111, 119, 127, 135, 143, 151, 159, 167, 175, 183, 191, 199, 207, 215, 223, 231, 239, 247, 255

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Mitigation; Speculative Store Bypass disabled via prctl

Mitigation; usercopy/swaps barriers and __user pointer sanitization

Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling; PBRSE-eIBRS SW sequence; BHI BHI_DIS_S

Not affected

Not affected

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	6M	12	Data	1	64	1	64
L1i	32K	4M	8	Instruction	1	64	1	64
L2	2M	256M	16	Unified	2	2048	1	64
L3	60M	240M	15	Unified	3	65536	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, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232, 240, 248

node 0 size: 127956 MB

node 0 free: 127408 MB

node 1 cpus:

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Platform Notes (Continued)

4, 12, 20, 28, 36, 44, 52, 60, 68, 76, 84, 92, 100, 108, 116, 124, 132, 140, 148, 156, 164, 172, 180, 188, 196, 204, 212, 220, 228, 236, 244, 252
node 1 size: 129015 MB
node 1 free: 128700 MB
node 2 cpus:
1, 9, 17, 25, 33, 41, 49, 57, 65, 73, 81, 89, 97, 105, 113, 121, 129, 137, 145, 153, 161, 169, 177, 185, 193, 201, 209, 217, 225, 233, 241, 249
node 2 size: 129015 MB
node 2 free: 128533 MB
node 3 cpus:
5, 13, 21, 29, 37, 45, 53, 61, 69, 77, 85, 93, 101, 109, 117, 125, 133, 141, 149, 157, 165, 173, 181, 189, 197, 205, 213, 221, 229, 237, 245, 253
node 3 size: 128972 MB
node 3 free: 128489 MB
node 4 cpus:
2, 10, 18, 26, 34, 42, 50, 58, 66, 74, 82, 90, 98, 106, 114, 122, 130, 138, 146, 154, 162, 170, 178, 186, 194, 202, 210, 218, 226, 234, 242, 250
node 4 size: 129015 MB
node 4 free: 128448 MB
node 5 cpus:
6, 14, 22, 30, 38, 46, 54, 62, 70, 78, 86, 94, 102, 110, 118, 126, 134, 142, 150, 158, 166, 174, 182, 190, 198, 206, 214, 222, 230, 238, 246, 254
node 5 size: 129015 MB
node 5 free: 128639 MB
node 6 cpus:
3, 11, 19, 27, 35, 43, 51, 59, 67, 75, 83, 91, 99, 107, 115, 123, 131, 139, 147, 155, 163, 171, 179, 187, 195, 203, 211, 219, 227, 235, 243, 251
node 6 size: 129015 MB
node 6 free: 117371 MB
node 7 cpus:
7, 15, 23, 31, 39, 47, 55, 63, 71, 79, 87, 95, 103, 111, 119, 127, 135, 143, 151, 159, 167, 175, 183, 191, 199, 207, 215, 223, 231, 239, 247, 255
node 7 size: 129000 MB
node 7 free: 128552 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

9. /proc/meminfo
MemTotal: 1055751940 kB

10. who -r
run-level 3 Oct 23 10:37

11. Systemd service manager version: systemd 252 (252-46.el9_5.3)
Default Target Status
multi-user running

12. Services, from systemctl list-unit-files

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STATE	UNIT FILES
enabled	ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond dbus-broker firewalld gdm getty@ insights-client-boot irqbalance iscsi iscsi-onboot iscsi-starter kdump libstoragemgmt low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname nvme-fc-boot-connections ostree-remount power-profiles-daemon qemu-guest-agent rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark smartd sshd sssd switcheroo-control systemd-boot-update systemd-network-generator tuned udisks2 upower vgauthd vmtoolsd
enabled-runtime	systemd-remount-fs
disabled	arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot chrony-wait chronyd-restricted cni-dhcp console-getty cpupower cups cups-browsed dbus-daemon debug-shell dnf-system-upgrade dnsmasq iprump iprinit iprupdate iscsi-init iscsid iscsiui kpatch kvm_stat ledmon lvm-devices-import man-db-restart-cache-update netavark-dhcp-proxy netavark-firewalld-reload nftables nvme-autoconnect ostree-readonly-sysroot-migration ostree-state-overlay@ podman podman-auto-update podman-clean-transient podman-kube@ podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts rpmbd-rebuild selinux-check-proper-disable serial-getty@ speech-dispatcherd sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysextr wpa_supplicant
indirect	spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate systemd-sysupdate-reboot

13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-503.38.1.el9_5.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
rhgb
quiet

14. cpupower frequency-info
analyzing CPU 106:
current policy: frequency should be within 4.10 GHz and 4.10 GHz.
The governor "performance" may decide which speed to use
within this range.
boost state support:
Supported: yes
Active: yes

15. tuned-adm active
Current active profile: throughput-performance

16. 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	40
vm.dirty_writeback_centisecs	500

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Platform Notes (Continued)

```
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               10
vm.watermark_boost_factor   15000
vm.watermark_scale_factor   10
vm.zone_reclaim_mode        0
```

```
-----
17. /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
-----
```

```
-----
18. /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
-----
```

```
-----
19. OS release
From /etc/*-release /etc/*-version
os-release           Red Hat Enterprise Linux 9.5 (Plow)
redhat-release       Red Hat Enterprise Linux release 9.5 (Plow)
system-release       Red Hat Enterprise Linux release 9.5 (Plow)
-----
```

```
-----
20. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2024.1
Filesystem      Type  Size  Used Avail Use% Mounted on
tmpfs           tmpfs 140G  5.0G 136G   4% /mnt/ramdisk
-----
```

```
-----
21. /sys/devices/virtual/dmi/id
Vendor:         Dell Inc.
Product:        PowerEdge R960
Product Family: PowerEdge
Serial:         SLR9601
-----
```

```
-----
22. dmidecode
Additional information from dmidecode 3.6 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:
  21x 00AD063200AD HMC88AGBRA188N 32 GB 2 rank 5600, configured at 4800
  11x 00AD063200AD HMC88AGBRA190N 32 GB 2 rank 5600, configured at 4800
-----
```

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SPEC CPU®2017 Integer Rate Result

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Dell Inc.

SPECrate®2017_int_base = 1180

PowerEdge R960 (Intel Xeon Gold 6448H)

SPECrate®2017_int_peak = 1220

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2025

Hardware Availability: Mar-2025

Software Availability: Apr-2025

Platform Notes (Continued)

23. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: Dell Inc.

BIOS Version: 2.7.5

BIOS Date: 07/31/2025

BIOS Revision: 2.7

Compiler Version Notes

C | 502.gcc_r(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

C | 502.gcc_r(peak)

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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 2024.1.0 Build 20240308
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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 2024.1.0 Build 20240308
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Fortran | 548.exchange2_r(base, peak)

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Software Availability: Apr-2025

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/2024.1/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/2024.1/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/2024.1/lib -lqkmalloc



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Tested by: Dell Inc.

Test Date: Oct-2025

Hardware Availability: Mar-2025

Software Availability: Apr-2025

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/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

502.gcc_r: -m32 -L/opt/intel/oneapi/compiler/2024.1/lib32 -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
```

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Software Availability: Apr-2025

Peak Optimization Flags (Continued)

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsapfirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmallo

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-ic2024-official-linux64.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.17.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-v1.17.xml>

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