



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017_int_base = 14.6

PowerEdge R860 (Intel Xeon Platinum 8460H)

SPECspeed®2017_int_peak = 14.8

CPU2017 License: 6573

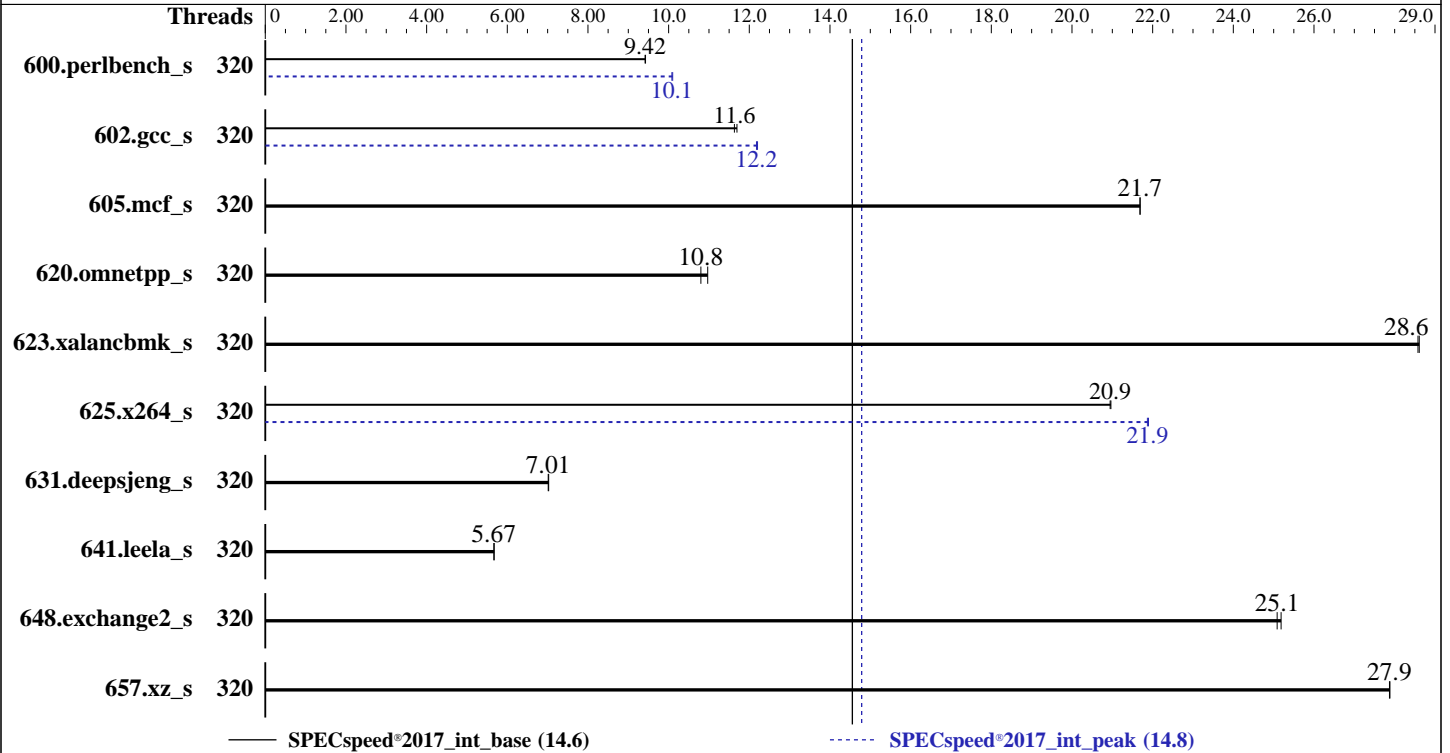
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2023

Hardware Availability: May-2023

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Platinum 8460H
 Max MHz: 3800
 Nominal: 2200
 Enabled: 160 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: 105 MB I+D on chip per chip
 Other: None
 Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)
 Storage: 160 GB on tmpfs
 Other: None

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
 5.14.0-70.13.1.el9_0.x86_64
 Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++
 Compiler for Linux;
 Fortran: Version 2023.0 of Intel Fortran Compiler
 for Linux;
 Parallel: Yes
 Firmware: Version 1.4.0 released Mar-2023
 File System: tmpfs
 System State: Run level 5 (graphical 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.



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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	320	189	9.42	188	9.43			320	176	10.1	176	10.1		
602.gcc_s	320	342	11.6	341	11.7			320	326	12.2	327	12.2		
605.mcf_s	320	218	21.7	218	21.7			320	218	21.7	218	21.7		
620.omnetpp_s	320	149	11.0	151	10.8			320	149	11.0	151	10.8		
623.xalancbmk_s	320	49.5	28.6	49.6	28.6			320	49.5	28.6	49.6	28.6		
625.x264_s	320	84.2	20.9	84.1	21.0			320	80.6	21.9	80.7	21.9		
631.deepsjeng_s	320	204	7.01	204	7.03			320	204	7.01	204	7.03		
641.leela_s	320	301	5.67	301	5.68			320	301	5.67	301	5.68		
648.exchange2_s	320	117	25.2	117	25.1			320	117	25.2	117	25.1		
657.xz_s	320	222	27.9	222	27.9			320	222	27.9	222	27.9		

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

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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:

KMP_AFFINITY = "granularity=fine,scatter"

LD_LIBRARY_PATH =

"/mnt/ramdisk/cpu2017-1.1.9-ic2023.0/lib/intel64:/mnt/ramdisk/cpu2017-1.1.9-ic2023.0/je5.0.1-64"

MALLOC_CONF = "retain:true"

OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default

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General Notes (Continued)

Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
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

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.

Benchmark run from a 160 GB ramdisk created with the cmd: "mount -t tmpfs -o size=160G tmpfs /mnt/ramdisk"

Platform Notes

BIOS settings:

ADDC Setting : Disabled
DIMM Self Healing on
Uncorrectable Memory Error : Disabled
Sub NUMA Cluster : 4-way Clustering
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-ic2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Wed Mar 29 21:28:17 2023

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

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Platform Notes (Continued)

- 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
21:28:17 up 19 min, 1 user, load average: 0.39, 16.54, 23.39
USER      TTY      LOGIN@   IDLE   JCPU   PCPU   WHAT
root      :l          21:10   ?xdm?  21:59   0.00s  /usr/libexec/gdm-x-session --register-session --run-script
gnome-session
```

```
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) 8254044
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) 8254044
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited
```

```
5. sysinfo process ancestry
/usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
/usr/lib/systemd/systemd --user
/usr/libexec/gnome-terminal-server
bash
/bin/bash ./DELL_speed.sh
/bin/bash ./dell-run-main.sh speed
/bin/bash ./dell-run-main.sh speed
/bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-adddcD=1
--define DL-BIOS-SNC=4 --output_format csv,html,pdf,txt
/bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-adddcD=1
--define DL-BIOS-SNC=4 --output_format csv,html,pdf,txt
runcpu --nobuild --action validate --define default-platform-flags -c
ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=160 --tune base,peak -o all --define
```

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Platform Notes (Continued)

```

intspeedaffinity --define smt-on --define drop_caches --iterations 2 --define
DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-adddcD=1 --define DL-BIOS-SNC=4 --output_format
csv,html,pdf,txt intspeed
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=160 --tune base,peak --output_format all
--define intspeedaffinity --define smt-on --define drop_caches --iterations 2 --define
DL-BIOSinc=Dell-BIOS_Xeon-4.inc --define DL-BIOS-adddcD=1 --define DL-BIOS-SNC=4 --output_format
csv,html,pdf,txt --nopower --runmode speed --tune base:peak --size refspeed intspeed --nopreenv
--note-preenv --logfile $SPEC/tmp/CPU2017.001/templogs/preenv.intspeed.001.0.log --lognum 001.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2023.0

```

```

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) Platinum 8460H
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 8
microcode      : 0x2b0001b0
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores      : 40
siblings       : 80
4 physical ids (chips)
320 processors (hardware threads)
physical id 0: core ids 0-39
physical id 1: core ids 0-39
physical id 2: core ids 0-39
physical id 3: core ids 0-39
physical id 0: apicids 0-79
physical id 1: apicids 128-207
physical id 2: apicids 256-335
physical id 3: apicids 384-463

```

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):            320
On-line CPU(s) list: 0-319
Vendor ID:         GenuineIntel
BIOS Vendor ID:   Intel
Model name:        Intel(R) Xeon(R) Platinum 8460H
BIOS Model name:   Intel(R) Xeon(R) Platinum 8460H
CPU family:        6
Model:             143
Thread(s) per core: 2
Core(s) per socket: 40
Socket(s):         4
Stepping:          8
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

```

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Platform Notes (Continued)

```
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 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 cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
vmmi 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
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
```

Virtualization:

```
VT-x
L1d cache: 7.5 MiB (160 instances)
L1i cache: 5 MiB (160 instances)
L2 cache: 320 MiB (160 instances)
L3 cache: 420 MiB (4 instances)
NUMA node(s): 16
NUMA node0 CPU(s): 0,8,16,24,32,40,48,56,64,72,160,168,176,184,192,200,208,216,224,232
NUMA node1 CPU(s): 80,88,96,104,112,120,128,136,144,152,240,248,256,264,272,280,288,296,304,312
NUMA node2 CPU(s): 4,12,20,28,36,44,52,60,68,76,164,172,180,188,196,204,212,220,228,236
NUMA node3 CPU(s): 84,92,100,108,116,124,132,140,148,156,244,252,260,268,276,284,292,300,308,316
NUMA node4 CPU(s): 1,9,17,25,33,41,49,57,65,73,161,169,177,185,193,201,209,217,225,233
NUMA node5 CPU(s): 81,89,97,105,113,121,129,137,145,153,241,249,257,265,273,281,289,297,305,313
NUMA node6 CPU(s): 5,13,21,29,37,45,53,61,69,77,165,173,181,189,197,205,213,221,229,237
NUMA node7 CPU(s): 85,93,101,109,117,125,133,141,149,157,245,253,261,269,277,285,293,301,309,317
NUMA node8 CPU(s): 2,10,18,26,34,42,50,58,66,74,162,170,178,186,194,202,210,218,226,234
NUMA node9 CPU(s): 82,90,98,106,114,122,130,138,146,154,242,250,258,266,274,282,290,298,306,314
NUMA node10 CPU(s): 6,14,22,30,38,46,54,62,70,78,166,174,182,190,198,206,214,222,230,238
NUMA node11 CPU(s): 86,94,102,110,118,126,134,142,150,158,246,254,262,270,278,286,294,302,310,318
NUMA node12 CPU(s): 3,11,19,27,35,43,51,59,67,75,163,171,179,187,195,203,211,219,227,235
NUMA node13 CPU(s): 83,91,99,107,115,123,131,139,147,155,243,251,259,267,275,283,291,299,307,315
NUMA node14 CPU(s): 7,15,23,31,39,47,55,63,71,79,167,175,183,191,199,207,215,223,231,239
NUMA node15 CPU(s): 87,95,103,111,119,127,135,143,151,159,247,255,263,271,279,287,295,303,311,319
```

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/swaps 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	7.5M	12	Data	1	64	1	64
L1i	32K	5M	8	Instruction	1	64	1	64
L2	2M	320M	16	Unified	2	2048	1	64

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Platform Notes (Continued)

L3 105M 420M 15 Unified 3 114688 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, 8, 16, 24, 32, 40, 48, 56, 64, 72, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232

node 0 size: 128343 MB

node 0 free: 122871 MB

node 1 cpus: 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 240, 248, 256, 264, 272, 280, 288, 296, 304, 312

node 1 size: 129019 MB

node 1 free: 128298 MB

node 2 cpus: 4, 12, 20, 28, 36, 44, 52, 60, 68, 76, 164, 172, 180, 188, 196, 204, 212, 220, 228, 236

node 2 size: 129019 MB

node 2 free: 128426 MB

node 3 cpus: 84, 92, 100, 108, 116, 124, 132, 140, 148, 156, 244, 252, 260, 268, 276, 284, 292, 300, 308, 316

node 3 size: 129019 MB

node 3 free: 128407 MB

node 4 cpus: 1, 9, 17, 25, 33, 41, 49, 57, 65, 73, 161, 169, 177, 185, 193, 201, 209, 217, 225, 233

node 4 size: 129019 MB

node 4 free: 128611 MB

node 5 cpus: 81, 89, 97, 105, 113, 121, 129, 137, 145, 153, 241, 249, 257, 265, 273, 281, 289, 297, 305, 313

node 5 size: 129019 MB

node 5 free: 128714 MB

node 6 cpus: 5, 13, 21, 29, 37, 45, 53, 61, 69, 77, 165, 173, 181, 189, 197, 205, 213, 221, 229, 237

node 6 size: 129019 MB

node 6 free: 122562 MB

node 7 cpus: 85, 93, 101, 109, 117, 125, 133, 141, 149, 157, 245, 253, 261, 269, 277, 285, 293, 301, 309, 317

node 7 size: 129019 MB

node 7 free: 128707 MB

node 8 cpus: 2, 10, 18, 26, 34, 42, 50, 58, 66, 74, 162, 170, 178, 186, 194, 202, 210, 218, 226, 234

node 8 size: 129019 MB

node 8 free: 128687 MB

node 9 cpus: 82, 90, 98, 106, 114, 122, 130, 138, 146, 154, 242, 250, 258, 266, 274, 282, 290, 298, 306, 314

node 9 size: 129019 MB

node 9 free: 128708 MB

node 10 cpus: 6, 14, 22, 30, 38, 46, 54, 62, 70, 78, 166, 174, 182, 190, 198, 206, 214, 222, 230, 238

node 10 size: 128983 MB

node 10 free: 128663 MB

node 11 cpus: 86, 94, 102, 110, 118, 126, 134, 142, 150, 158, 246, 254, 262, 270, 278, 286, 294, 302, 310, 318

node 11 size: 129019 MB

node 11 free: 128722 MB

node 12 cpus: 3, 11, 19, 27, 35, 43, 51, 59, 67, 75, 163, 171, 179, 187, 195, 203, 211, 219, 227, 235

node 12 size: 129019 MB

node 12 free: 128687 MB

node 13 cpus: 83, 91, 99, 107, 115, 123, 131, 139, 147, 155, 243, 251, 259, 267, 275, 283, 291, 299, 307, 315

node 13 size: 129019 MB

node 13 free: 128712 MB

node 14 cpus: 7, 15, 23, 31, 39, 47, 55, 63, 71, 79, 167, 175, 183, 191, 199, 207, 215, 223, 231, 239

node 14 size: 129019 MB

node 14 free: 128703 MB

node 15 cpus: 87, 95, 103, 111, 119, 127, 135, 143, 151, 159, 247, 255, 263, 271, 279, 287, 295, 303, 311, 319

node 15 size: 128990 MB

node 15 free: 128695 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

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Platform Notes (Continued)

4:	21	21	21	21	10	12	12	12	21	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	21
6:	21	21	21	21	12	12	10	12	21	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	21
8:	21	21	21	21	21	21	21	21	10	12	12	12	21	21	21	21	21
9:	21	21	21	21	21	21	21	21	12	10	12	12	21	21	21	21	21
10:	21	21	21	21	21	21	21	21	12	12	10	12	21	21	21	21	21
11:	21	21	21	21	21	21	21	21	12	12	12	10	21	21	21	21	21
12:	21	21	21	21	21	21	21	21	21	21	21	10	12	12	12	12	12
13:	21	21	21	21	21	21	21	21	21	21	21	21	12	10	12	12	12
14:	21	21	21	21	21	21	21	21	21	21	21	21	12	12	10	12	12
15:	21	21	21	21	21	21	21	21	21	21	21	21	12	12	12	10	12

9. /proc/meminfo
MemTotal: 2113098540 kB

10. who -r
run-level 5 Mar 29 21:09

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

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker gdm getty@ insights-client-boot irgbalance iscsi iscsi-onboot kdump libstoragemgmt lm_sensors low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname nvme-fc-boot-connections ostree-remount pcmd pmie pmllogger power-profiles-daemon qemu-guest-agent rhsmcertd rpcbind rsyslog rtkit-daemon selinux-autorelabel-mark smartd sshd sssd switcheroo-control sysstat systemd-network-generator udisks2 upower vgauthd virtqemud vmtoolsd
enabled-runtime	systemd-remount-fs
disabled	arp-ethers autofs blk-availability brltty canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed dbus-daemon debug-shell dnsmasq dovecot fancontrol fcoe firewalld grafana-server gssproxy httpd httpd@ ibacm iprump iprint iprupdate ipsec iscsid iscsiuiop kpatch kvm_stat ledmon libvirt-guests libvirtd lldpad man-db-restart-cache-update named named-chroot nfs-blkmap nfs-server nftables nmb numad nvme-fc-autoconnect pmfind pmie_farm pmllogger_farm pmproxy podman podman-auto-update podman-restart postfix powertop psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts rpmdb-rebuild rrdcached saslauthd serial-getty@ smb snmpd snmptrapd spamassassin speech-dispatcherd srp_daemon srp_daemon_port@ sshd-keygen@ systemd-boot-check-no-failures systemd-nspawn@ systemd-pstore systemd-sysex target targetclid tog-pegasus trace-cmd virtinterfaced virtnetworkd virtnodedevd virtnwfilterd virtproxyd virtsecret virtstoraged vsftpd wpa_supplicant
indirect	pcscd spice-vdagentd sssd autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo virtlockd virtlogd vsftpd@

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
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root

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PowerEdge R860 (Intel Xeon Platinum 8460H)

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Software Availability: Dec-2022

Platform Notes (Continued)

```
rd.lvm.lv=rhel/swap
rhgb
quiet
```

```
-----
14. cpupower frequency-info
analyzing CPU 0:
  Unable to determine current policy
  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
enabled         [always] madvice 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
-----
```

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Platform Notes (Continued)

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2023.0

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
tmpfs	tmpfs	160G	4.2G	156G	3%	/mnt/ramdisk

20. /sys/devices/virtual/dmi/id

```
Vendor:      Dell Inc.
Product:     PowerEdge R860
Product Family: PowerEdge
Serial:      1234567
```

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:

```
18x 00AD00B300AD HMC94MEBRA123N 64 GB 2 rank 4800
14x 00AD063200AD HMC94MEBRA109N 64 GB 2 rank 4800
```

22. BIOS

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

```
BIOS Vendor:      Dell Inc.
BIOS Version:     1.4.0
BIOS Date:        03/15/2023
BIOS Revision:    1.4
```

Compiler Version Notes

```
=====  
C      | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)  
      | 657.xz_s(base, peak)  
=====
```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

```
=====  
C++    | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)  
      | 641.leela_s(base, peak)  
=====
```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

```
=====  
Fortran | 648.exchange2_s(base, peak)  
=====
```

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.



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Software Availability: Dec-2022

Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Base Portability Flags

```
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:

```
-m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:

```
-m64 -std=c++14 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:

```
-m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```



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Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast(pass 1) -xCORE-AVX512 -O3 -ffast-math
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-fiopenmp -DSPEC_OPENMP -fno-strict-overflow
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

```
602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast(pass 1) -xCORE-AVX512 -O3 -ffast-math
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-fiopenmp -DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc
```

```
605.mcf_s: basepeak = yes
```

```
625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

```
657.xz_s: basepeak = yes
```

C++ benchmarks:

(Continued on next page)



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Software Availability: Dec-2022

Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

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

<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.3.xml>

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Tested with SPEC CPU®2017 v1.1.9 on 2023-03-29 21:28:16-0400.

Report generated on 2024-01-29 17:45:51 by CPU2017 PDF formatter v6716.

Originally published on 2023-05-23.