



SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

SPECrate®2017_fp_base = 201

PowerEdge XR11 (Intel Xeon Gold 6338N, 2.20 GHz)

SPECrate®2017_fp_peak = 209

CPU2017 License: 6573

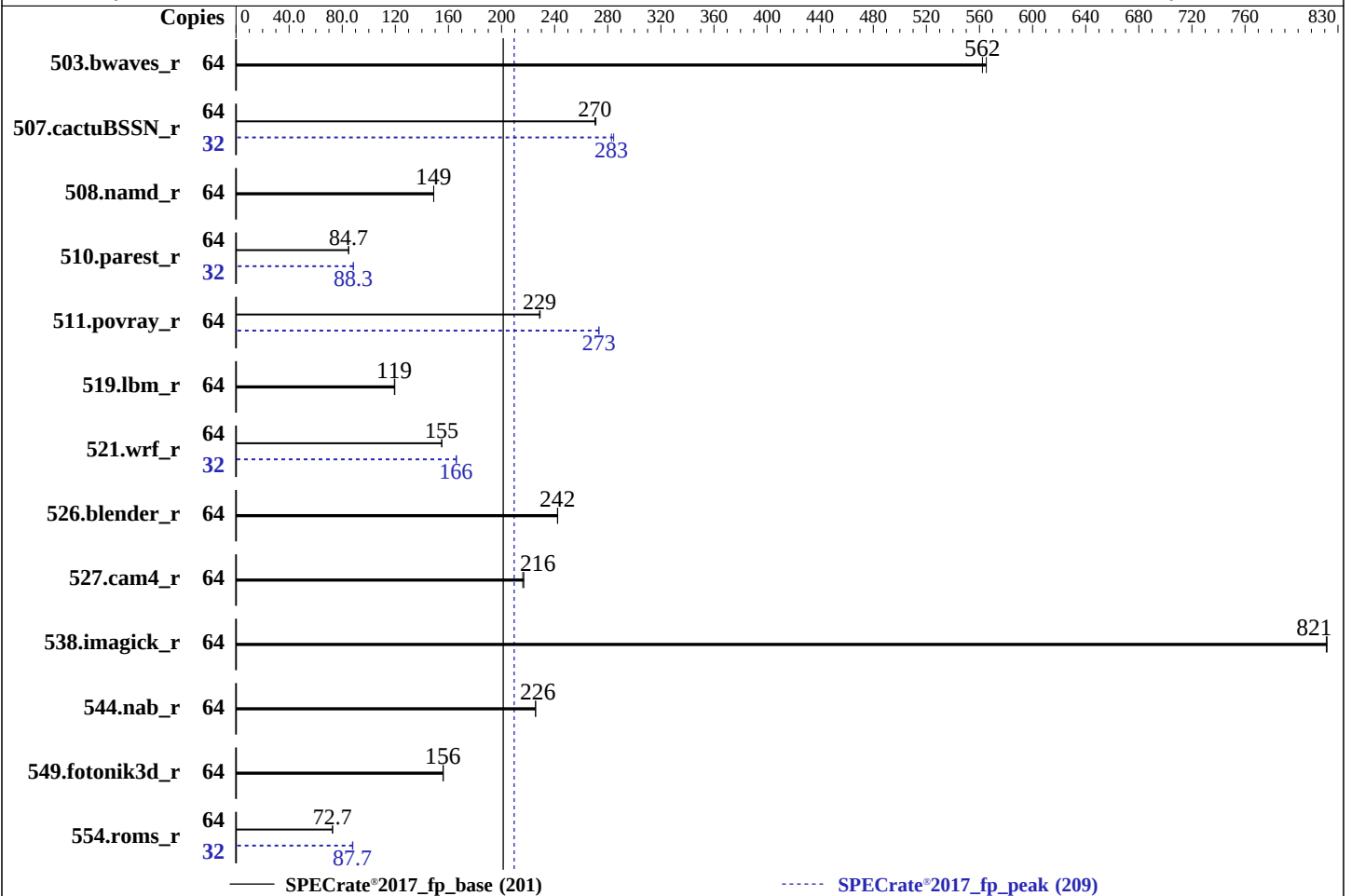
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Apr-2025

Hardware Availability: Dec-2022

Software Availability: Jun-2024



Hardware

CPU Name: Intel Xeon Gold 6338N
Max MHz: 3500
Nominal: 2200
Enabled: 32 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 48 MB I+D on chip per chip
Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R, running at 2666)
Storage: 60 GB on tmpfs
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6 6.4.0-150600.21-default
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 1.16.2 released Jan-2025
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS 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
503.bwaves_r	64	<u>1142</u>	<u>562</u>	1136	565			64	<u>1142</u>	<u>562</u>	1136	565		
507.cactuBSSN_r	64	299	271	<u>300</u>	<u>270</u>			32	142	284	<u>143</u>	<u>283</u>		
508.namd_r	64	408	149	<u>408</u>	<u>149</u>			64	408	149	<u>408</u>	<u>149</u>		
510.parest_r	64	1974	84.8	<u>1976</u>	<u>84.7</u>			32	<u>948</u>	<u>88.3</u>	947	88.4		
511.povray_r	64	<u>654</u>	<u>229</u>	652	229			64	<u>547</u>	<u>273</u>	547	273		
519.lbm_r	64	564	120	<u>566</u>	<u>119</u>			64	564	120	<u>566</u>	<u>119</u>		
521.wrf_r	64	925	155	<u>926</u>	<u>155</u>			32	<u>432</u>	<u>166</u>	432	166		
526.blender_r	64	<u>403</u>	<u>242</u>	402	242			64	<u>403</u>	<u>242</u>	402	242		
527.cam4_r	64	516	217	<u>518</u>	<u>216</u>			64	516	217	<u>518</u>	<u>216</u>		
538.imagick_r	64	194	822	<u>194</u>	<u>821</u>			64	194	822	<u>194</u>	<u>821</u>		
544.nab_r	64	<u>477</u>	<u>226</u>	477	226			64	<u>477</u>	<u>226</u>	477	226		
549.fotonik3d_r	64	1597	156	<u>1600</u>	<u>156</u>			64	1597	156	<u>1600</u>	<u>156</u>		
554.roms_r	64	<u>1399</u>	<u>72.7</u>	1399	72.7			32	<u>580</u>	<u>87.7</u>	578	88.0		

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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/je5.0.1-64"

MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
jemalloc, a general purpose malloc implementation

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General Notes (Continued)

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 60 GB ramdisk created with the cmd: "mount -t tmpfs -o size=60G tmpfs /mnt/ramdisk"

Platform Notes

BIOS Settings:

Virtualization Technology : Disabled
Sub NUMA Cluster : 2-Way Clustering
x2APIC Mode : 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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-ic2024.1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on JRX8ZC3-XR11 Thu Apr 10 15:43:49 2025

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 254 (254.10+suse.84.ge8d77af424)
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

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Platform Notes (Continued)

```
-----
1. uname -a
Linux JRX8ZC3-XR11 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
x86_64 x86_64 x86_64 GNU/Linux

-----
2. w
15:43:49 up 5:40, 1 user, load average: 43.52, 59.05, 61.95
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 10:04 5:38m 1.43s 0.01s /bin/bash
/home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-VERS=6.1a --output_format html, pdf, txt

-----
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) 2061540
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) 2061540
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
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=6.1a --output_format
html, pdf, txt
/bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-VERS=6.1a --output_format
html, pdf, txt
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=64 -c
ic2024.1-lin-core-avx512-rate-20240308.cfg --define smt-on --define cores=32 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak -o all --iterations 2 --define
DL-VERS=6.1a --output_format html, pdf, txt fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=64 --configfile
ic2024.1-lin-core-avx512-rate-20240308.cfg --define smt-on --define cores=32 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --iterations 2
--define DL-VERS=6.1a --output_format html, pdf, txt --nopower --runmode rate --tune base:peak --size
refrate fprate --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.002/templots/preenv.fprate.002.0.log
--lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
```

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Platform Notes (Continued)

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

6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz
vendor_id       : GenuineIntel
cpu family      : 6
model           : 106
stepping        : 6
microcode       : 0xd0003f5
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs mmio_stale_data eibrs_pbrsb gds bhi
cpu cores       : 32
siblings        : 64
1 physical ids (chips)
64 processors (hardware threads)
physical id 0: core ids 0-31
physical id 0: apicids 0-63
```

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 2.39.3:

```
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):            64
On-line CPU(s) list: 0-63
Vendor ID:         GenuineIntel
BIOS Vendor ID:    Intel
Model name:        Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz
BIOS Model name:   Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz   CPU @ 2.2GHz
BIOS CPU family:   179
CPU family:        6
Model:            106
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s):         1
Stepping:          6
CPU(s) scaling MHz: 31%
CPU max MHz:       3500.0000
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 aperfmpperf 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
                  intel_ppin 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 wbnoinvd
                  dtherm ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfni
                  vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57
                  rdpid fsrm md_clear pconfig flush_l1d arch_capabilities
```

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Platform Notes (Continued)

L1d cache: 1.5 MiB (32 instances)
L1i cache: 1 MiB (32 instances)
L2 cache: 40 MiB (32 instances)
L3 cache: 48 MiB (1 instance)
NUMA node(s): 2
NUMA node0 CPU(s): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62
NUMA node1 CPU(s): 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63
Vulnerability Gather data sampling: Mitigation; Microcode
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Mitigation; Clear CPU buffers; SMT vulnerable
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec rstack overflow: 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 / Automatic IBRS; IBPB conditional; RSB filling; PBRBS-eIBRS SW sequence; BHI SW loop, KVM SW loop
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	1.5M	12	Data	1	64	1	64
L1i	32K	1M	8	Instruction	1	64	1	64
L2	1.3M	40M	20	Unified	2	1024	1	64
L3	48M	48M	12	Unified	3	65536	1	64

8. numactl --hardware

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

available: 2 nodes (0-1)

node 0 cpus: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62

node 0 size: 257392 MB

node 0 free: 255734 MB

node 1 cpus: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63

node 1 size: 258018 MB

node 1 free: 247012 MB

node distances:

node 0 1

0: 10 11

1: 11 10

9. /proc/meminfo

MemTotal: 527780952 kB

10. who -r

run-level 3 Apr 10 10:03

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)

Default Target Status

multi-user running

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Platform Notes (Continued)

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager firewalld getty@irqbalance issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime	systemd-remount-fs
disabled	autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info fsidd gpm grub2-once haveged ipmi ipmievd issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap rpcbind rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2 vncserver@
indirect	systemd-userdbd wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline

BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=9b2f3717-fac7-4d90-8e90-2b95e71274d8
splash=silent
resume=/dev/disk/by-uuid/543c5fbd-a02f-4349-95e7-af7a2de632f2
mitigations=auto
quiet
security=apparmor

14. cpupower frequency-info

analyzing CPU 61:
current policy: frequency should be within 800 MHz and 3.50 GHz.
The governor "powersave" may decide which speed to use within this range.
boost state support:
Supported: yes
Active: yes

15. sysctl

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

16. /sys/kernel/mm/transparent_hugepage

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Platform Notes (Continued)

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 SUSE Linux Enterprise Server 15 SP6

19. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2024.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 60G 5.0G 56G 9% /mnt/ramdisk

20. /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge XR11
Product Family: PowerEdge
Serial: JRX8ZC3

21. 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:
8x 00CE063200CE M393A8G40AB2-CWE 64 GB 2 rank 3200, configured at 2666

22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: Dell Inc.
BIOS Version: 1.16.2
BIOS Date: 01/10/2025
BIOS Revision: 1.16

Compiler Version Notes

=====

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Compiler Version Notes (Continued)

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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=====
C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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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++, C, Fortran | 507.cactuBSSN_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.
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.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

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

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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=====
Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

SPECrate®2017_fp_base = 201

PowerEdge XR11 (Intel Xeon Gold 6338N, 2.20 GHz)

SPECrate®2017_fp_peak = 209

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Apr-2025

Hardware Availability: Dec-2022

Software Availability: Jun-2024

Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-Wno-implicit-int -nostandard-realloc-lhs -align array32byte -auto  
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int -nostandard-realloc-lhs  
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx



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Software Availability: Jun-2024

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:

521.wrf_r: -w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int
-nostandard-realloc-lhs -align array32byte -auto
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

527.cam4_r: basepeak = yes

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Tested by: Dell Inc.

Test Date: Apr-2025

Hardware Availability: Dec-2022

Software Availability: Jun-2024

Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

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

```
526.blender_r: basepeak = yes
```

Benchmarks using Fortran, C, and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

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-v1.13.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-v1.13.xml>

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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 2025-04-10 15:43:49-0400.

Report generated on 2025-05-08 09:59:29 by CPU2017 PDF formatter v6716.

Originally published on 2025-05-06.