



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 155

PowerEdge R470 (Intel Xeon 6507P)

SPECrate®2017\_fp\_peak = 159

CPU2017 License: 6573

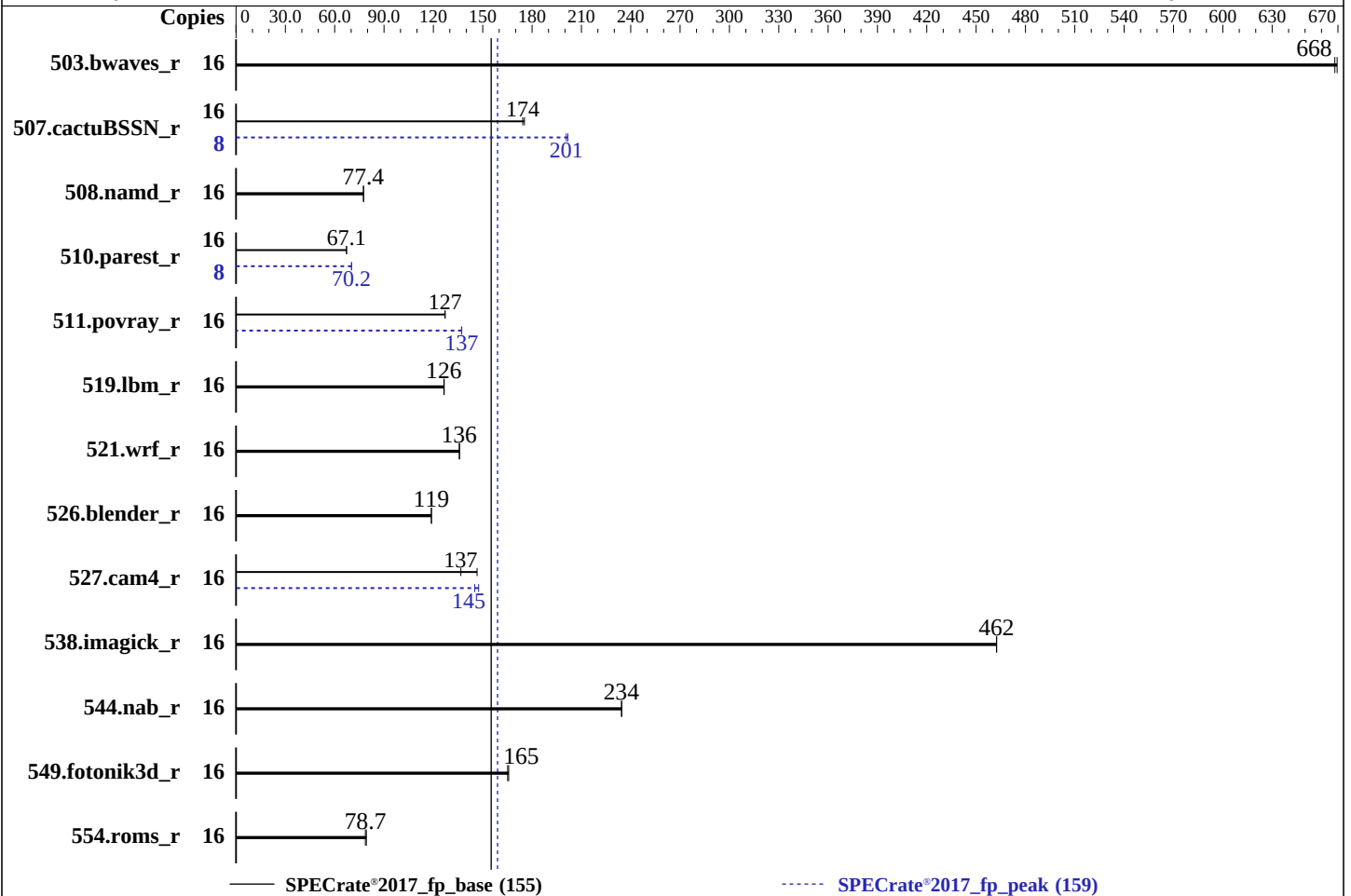
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: May-2025

Hardware Availability: Apr-2025

Software Availability: Jun-2024



## Hardware

CPU Name: Intel Xeon 6507P  
Max MHz: 4300  
Nominal: 3500  
Enabled: 8 cores, 1 chip, 2 threads/core  
Orderable: 1 chip  
Cache L1: 64 KB I + 48 KB D on chip per core  
L2: 2 MB I+D on chip per core  
L3: 48 MB I+D on chip per chip  
Other: None  
Memory: 256 GB (8 x 32 GB 2Rx8 PC5-6400B-R)  
Storage: 40 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 1.3.1 released Apr-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    | 16     | <b>240</b>  | <b>668</b>  | 240        | 669         |         |       | 16     | <b>240</b>  | <b>668</b>  | 240        | 669         |         |       |
| 507.cactuBSSN_r | 16     | 115         | 175         | <b>116</b> | <b>174</b>  |         |       | 8      | <b>50.4</b> | <b>201</b>  | 50.2       | 202         |         |       |
| 508.namd_r      | 16     | <b>196</b>  | <b>77.4</b> | 196        | 77.6        |         |       | 16     | <b>196</b>  | <b>77.4</b> | 196        | 77.6        |         |       |
| 510.parest_r    | 16     | <b>623</b>  | <b>67.1</b> | 623        | 67.2        |         |       | 8      | <b>298</b>  | <b>70.2</b> | 298        | 70.3        |         |       |
| 511.povray_r    | 16     | 294         | 127         | <b>294</b> | <b>127</b>  |         |       | 16     | <b>272</b>  | <b>137</b>  | 272        | 137         |         |       |
| 519.lbm_r       | 16     | <b>133</b>  | <b>126</b>  | 133        | 127         |         |       | 16     | <b>133</b>  | <b>126</b>  | 133        | 127         |         |       |
| 521.wrf_r       | 16     | 264         | 136         | <b>264</b> | <b>136</b>  |         |       | 16     | 264         | 136         | <b>264</b> | <b>136</b>  |         |       |
| 526.blender_r   | 16     | 205         | 119         | <b>205</b> | <b>119</b>  |         |       | 16     | 205         | 119         | <b>205</b> | <b>119</b>  |         |       |
| 527.cam4_r      | 16     | 191         | 147         | <b>205</b> | <b>137</b>  |         |       | 16     | 190         | 148         | <b>193</b> | <b>145</b>  |         |       |
| 538.imagick_r   | 16     | <b>86.1</b> | <b>462</b>  | 86.0       | 463         |         |       | 16     | <b>86.1</b> | <b>462</b>  | 86.0       | 463         |         |       |
| 544.nab_r       | 16     | <b>115</b>  | <b>234</b>  | 115        | 235         |         |       | 16     | <b>115</b>  | <b>234</b>  | 115        | 235         |         |       |
| 549.fotonik3d_r | 16     | 376         | 166         | <b>378</b> | <b>165</b>  |         |       | 16     | 376         | 166         | <b>378</b> | <b>165</b>  |         |       |
| 554.roms_r      | 16     | 321         | 79.2        | <b>323</b> | <b>78.7</b> |         |       | 16     | 321         | 79.2        | <b>323</b> | <b>78.7</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-ic2024.1/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 40 GB ramdisk created with the cmd: "mount -t tmpfs -o size=40G tmpfs /mnt/ramdisk"

## Platform Notes

### BIOS Settings:

Virtual NUMA Nodes : 8  
Sub NUMA Cluster : Enabled  
Optimizer Mode : Enabled

System Profile : Custom  
Energy Efficient Turbo : Disabled  
C1E : Disabled  
C-States : Autonomous  
Energy Efficient Policy : Performance

CPU Interconnect Bus -  
Link Power Management : Disabled  
PCI ASPM L1 Link Power Management : Disabled  
Correctable Memory ECC SMI : 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 1234567-R470 Wed May 28 08:00:52 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

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## Platform Notes (Continued)

19. Disk information

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

21. dmidecode

22. BIOS

-----

1. uname -a

```
Linux 1234567-R470 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

```
08:00:52 up 4:39, 1 user, load average: 12.08, 15.08, 15.61
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root      tty1      -               03:21    2:52m  1.39s  0.00s /bin/bash
/home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-VERS=6.2a --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) 1030317
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) 1030317
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=6.2a --output_format
html,pdf,txt
/bin/bash /home/DellFiles/bin/Intel/dell-run-speccpu.sh rate --define DL-VERS=6.2a --output_format
html,pdf,txt
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 -c
ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=8 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak -o all --iterations 2 --define
DL-VERS=6.2a --output_format html,pdf,txt fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=16 --configfile
ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=8 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --iterations 2
```

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## Platform Notes (Continued)

```
--define DL-VERS=6.2a --output_format html,pdf,txt --nopower --runmode rate --tune base:peak --size
refrate fprate --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log
--lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-ic2024.1
```

### 6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) 6507P
vendor_id       : GenuineIntel
cpu family      : 6
model           : 173
stepping        : 1
microcode       : 0x10003a5
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
cpu cores       : 8
siblings        : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-7
physical id 0: apicids 0-15
```

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:         52 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                16
On-line CPU(s) list:   0-15
Vendor ID:             GenuineIntel
BIOS Vendor ID:        Intel
Model name:            Intel(R) Xeon(R) 6507P
BIOS Model name:       Intel(R) Xeon(R) 6507P  CPU @ 3.5GHz
BIOS CPU family:       179
CPU family:            6
Model:                173
Thread(s) per core:    2
Core(s) per socket:    8
Socket(s):             1
Stepping:              1
BogoMIPS:              7000.00
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 intel_ppin cdp_l2
ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept
vpid ept_ad 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 user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida
```

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## Platform Notes (Continued)

### 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:

arat pln pts vnmi 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 ibt amx\_bf16 avx512\_fp16 amx\_tile  
amx\_int8 flush\_l1d arch\_capabilities

VT-x

384 KiB (8 instances)

512 KiB (8 instances)

16 MiB (8 instances)

48 MiB (1 instance)

8

0,8

5,13

3,11

6,14

7,15

1,9

2,10

4,12

Not affected

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;

PBRSB-eIBRS Not affected; 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      | 384K     | 12   | Data        | 1     | 64    | 1        | 64             |
| L1i  | 64K      | 512K     | 16   | Instruction | 1     | 64    | 1        | 64             |
| L2   | 2M       | 16M      | 16   | Unified     | 2     | 2048  | 1        | 64             |
| L3   | 48M      | 48M      | 16   | Unified     | 3     | 49152 | 1        | 64             |

8. numactl --hardware

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

available: 8 nodes (0-7)

node 0 cpus: 0,8

node 0 size: 32254 MB

node 0 free: 31945 MB

node 1 cpus: 5,13

node 1 size: 32216 MB

node 1 free: 31987 MB

node 2 cpus: 3,11

node 2 size: 32255 MB

node 2 free: 31969 MB

node 3 cpus: 6,14

node 3 size: 32255 MB

node 3 free: 21850 MB

node 4 cpus: 7,15

node 4 size: 32255 MB

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```
node 4 free: 31804 MB
node 5 cpus: 1,9
node 5 size: 32170 MB
node 5 free: 31833 MB
node 6 cpus: 2,10
node 6 size: 32222 MB
node 6 free: 32007 MB
node 7 cpus: 4,12
node 7 size: 31978 MB
node 7 free: 31769 MB
node distances:
node  0  1  2  3  4  5  6  7
0: 10 20 20 20 20 20 20 20
1: 20 10 20 20 20 20 20 20
2: 20 20 10 20 20 20 20 20
3: 20 20 20 10 20 20 20 20
4: 20 20 20 20 10 20 20 20
5: 20 20 20 20 20 10 20 20
6: 20 20 20 20 20 20 10 20
7: 20 20 20 20 20 20 20 10
```

9. /proc/meminfo

MemTotal: 263791188 kB

10. who -r

run-level 3 May 28 03:21

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

Default Target Status  
multi-user running

12. Services, from systemctl list-unit-files

| STATE           | UNIT FILES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| enabled         | ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online<br>YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd bluetooth cron<br>display-manager getty@ irqbalance issue-generator kbdsettings klog lvm2-monitor nscd<br>nvme-fc-boot-connections nvme-autoconnect postfix purge-kernels rollback rsyslog smartd<br>sshd systemd-pstore wpa_supplicant                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| enabled-runtime | systemd-remount-fs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| disabled        | accounts-daemon autofs autovast-initscripts blk-availability bluetooth-mesh boot-sysctl<br>ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell dnsmasq<br>ebtables exchange-bmc-os-info firewallld fsidd gpm grub2-once haveged hwloc-dump-hwdata<br>ipmi ipmievdev issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap<br>nm-cloud-setup nmb openvpn@ ostree-remount pppoe pppoe-server rpcbind rpmconfigcheck<br>rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd<br>speech-dispatcherd systemd-boot-check-no-failures systemd-confext<br>systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2<br>update-system-flatpaks upower vncserver@ wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6<br>wickedd-nanny wpa_supplicant@ |
| indirect        | pcscd systemd-userdbd wickedd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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

BOOT\_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default  
root=UUID=1c12c33d-b75a-4b70-bf85-f673b4f99355  
splash=silent

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## Platform Notes (Continued)

```
resume=/dev/disk/by-uuid/8694d044-c578-4891-879e-7f98dfefe412
mitigations=auto
quiet
security=apparmor
```

```
-----
14. cpupower frequency-info
   analyzing CPU 12:
     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 SUSE Linux Enterprise Server 15 SP6
```

```
-----
19. Disk information
   SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-ic2024.1
```

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# SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

SPECrate®2017\_fp\_base = 155

PowerEdge R470 (Intel Xeon 6507P)

SPECrate®2017\_fp\_peak = 159

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: May-2025

Hardware Availability: Apr-2025

Software Availability: Jun-2024

## Platform Notes (Continued)

| Filesystem | Type  | Size | Used | Avail | Use% | Mounted on   |
|------------|-------|------|------|-------|------|--------------|
| tmpfs      | tmpfs | 40G  | 5.0G | 36G   | 13%  | /mnt/ramdisk |

-----  
20. /sys/devices/virtual/dmi/id  
Vendor: Dell Inc.  
Product: PowerEdge R470  
Product Family: PowerEdge  
Serial: 1234567  
-----

-----  
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 00AD042300AD HMC688AHBRA471N 32 GB 2 rank 6400  
-----

-----  
22. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: Dell Inc.  
BIOS Version: 1.3.1  
BIOS Date: 04/24/2025  
BIOS Revision: 1.3  
-----

## Compiler Version Notes

=====

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

-----

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-----

=====

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

-----

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-----

=====

|        |                                                    |
|--------|----------------------------------------------------|
| C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak) |
|--------|----------------------------------------------------|

-----

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-----

=====

|                 |                             |
|-----------------|-----------------------------|
| C++, C, Fortran | 507.cactuBSSN_r(base, peak) |
|-----------------|-----------------------------|

-----

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## Compiler Version Notes (Continued)

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=====  
Fortran | 503.bwaves\_r(base, peak) 549.fotonik3d\_r(base, peak) 554.roms\_r(base, peak)  
=====

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=====  
Fortran, C | 521.wrf\_r(base, peak) 527.cam4\_r(base, peak)  
=====

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## Base 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

## Base Portability Flags

503.bwaves\_r: -DSPEC\_LP64  
507.cactuBSSN\_r: -DSPEC\_LP64  
508.namd\_r: -DSPEC\_LP64  
510.parest\_r: -DSPEC\_LP64

(Continued on next page)



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## Base Portability Flags (Continued)

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 -xsapphirerapids -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

-w -m64 -Wl,-z,muldefs -xsapphirerapids -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:

-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-Wno-implicit-int -mprefer-vector-width=512 -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 -xsapphirerapids -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512  
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:

-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast

(Continued on next page)



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## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512  
-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

## 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

(Continued on next page)



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## Peak Optimization Flags (Continued)

C++ benchmarks:

508.namd\_r: basepeak = yes

510.parest\_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids  
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -mprefer-vector-width=512  
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves\_r: basepeak = yes

549.fotonik3d\_r: basepeak = yes

554.roms\_r: basepeak = yes

Benchmarks using both Fortran and C:

521.wrf\_r: basepeak = yes

527.cam4\_r: -w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int  
-mprefer-vector-width=512 -nostandard-realloc-lhs  
-align array32byte -auto -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib

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.profddata(pass 2) -xCORE-AVX2(pass 1)  
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse  
-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int  
-mprefer-vector-width=512 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib

526.blender\_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512  
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib



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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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