



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 1410

PowerEdge R670 (Intel Xeon 6760P)

SPECrate®2017_fp_peak = 1460

CPU2017 License: 6573

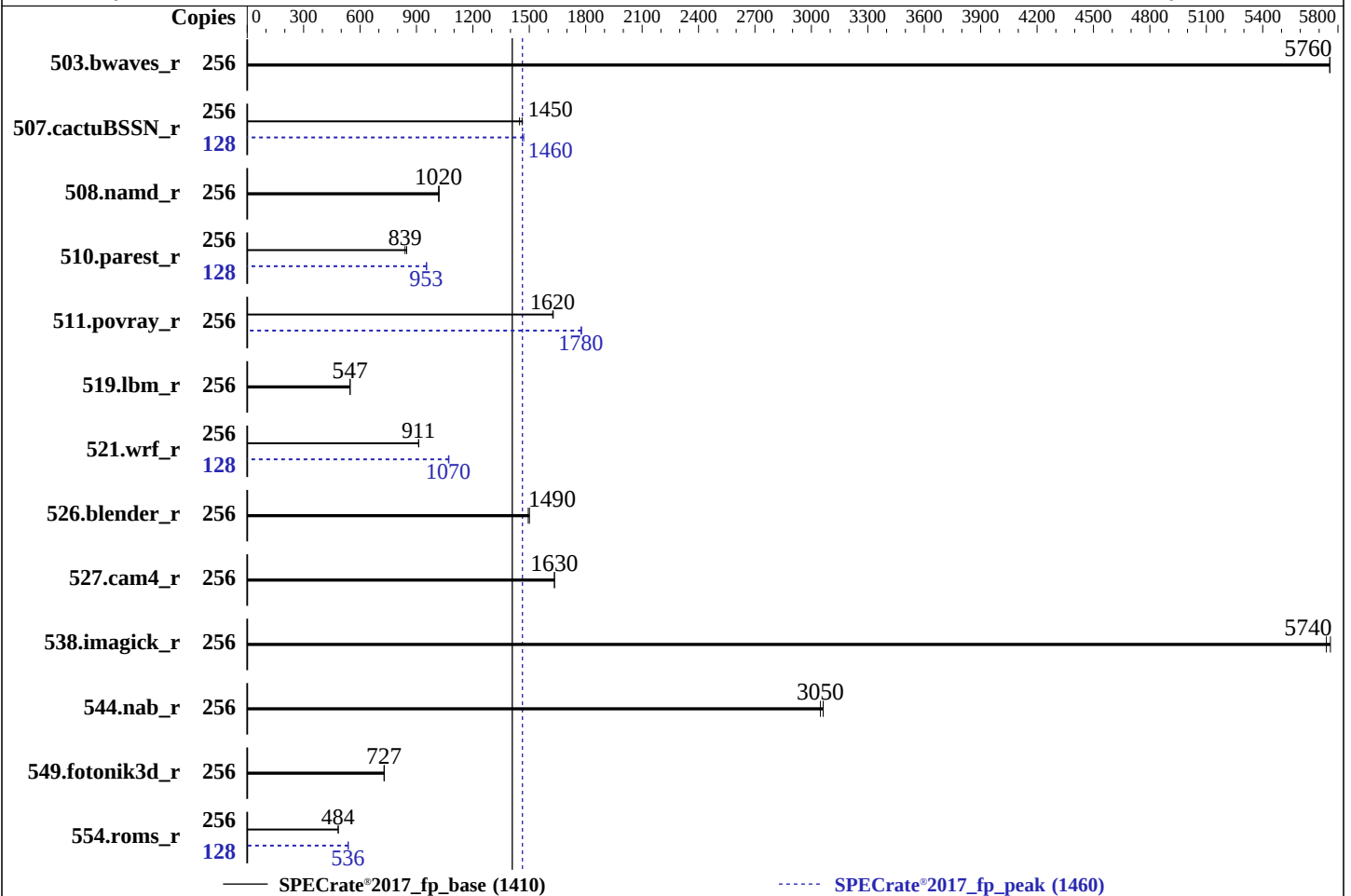
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024



Hardware

CPU Name: Intel Xeon 6760P
Max MHz: 3800
Nominal: 2200
Enabled: 128 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 64 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 320 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-6400B-R)
Storage: 140 GB on tmpfs
Other: CPU Cooling: DLC

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 1.2.6 released Feb-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	256	446	5760	446	5760			256	446	5760	446	5760		
507.cactuBSSN_r	256	222	1460	224	1450			128	110	1470	111	1460		
508.namd_r	256	239	1020	238	1020			256	239	1020	238	1020		
510.parest_r	256	798	839	790	848			128	351	954	351	953		
511.povray_r	256	368	1620	367	1630			256	337	1780	336	1780		
519.lbm_r	256	493	547	493	547			256	493	547	493	547		
521.wrf_r	256	629	911	629	912			128	267	1070	268	1070		
526.blender_r	256	261	1490	260	1500			256	261	1490	260	1500		
527.cam4_r	256	274	1630	274	1630			256	274	1630	274	1630		
538.imagick_r	256	111	5740	111	5760			256	111	5740	111	5760		
544.nab_r	256	141	3060	141	3050			256	141	3060	141	3050		
549.fotonik3d_r	256	1367	730	1372	727			256	1367	730	1372	727		
554.roms_r	256	841	484	841	484			128	379	536	378	538		

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

Platform Notes

BIOS Settings:

Adjacent Cache Line Prefetch : Disabled
DCU Streamer Prefetcher : Disabled
Sub NUMA Cluster : Enabled
XPT Prefetch : Disabled
LLC Prefetch : Enabled
Optimizer Mode : Enabled

System Profile : Custom
CPU Power Management : Maximum Performance
C1E : Disabled
C-States : Autonomous
Latency Optimized Mode : Enabled
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 DNN3108-R670 Wed Mar 26 00:31:30 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

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Platform Notes (Continued)

```
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
```

```
1. uname -a
Linux DNN3108-R670 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
00:31:30 up 3:56, 1 user, load average: 172.26, 234.74, 246.44
USER      TTY      FROM          LOGIN@      IDLE        JCPU   PCPU WHAT
root      tty1      -             20:40       3:49m      1.03s   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) 2060200
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) 2060200
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=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
```

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Platform Notes (Continued)

```
DL-VERS=6.1a --output_format html,pdf,txt fprate
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=6.1a --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) 6760P
vendor_id       : GenuineIntel
cpu family      : 6
model           : 173
stepping        : 1
microcode       : 0x1000380
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
cpu cores       : 64
siblings        : 128
2 physical ids (chips)
256 processors (hardware threads)
physical id 0:  core ids 0-31,64-95
physical id 1:  core ids 0-31,64-95
physical id 0:  apicids 0-63,128-191
physical id 1:  apicids 256-319,384-447
```

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 2.39.3:

```
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):             256
On-line CPU(s) list: 0-255
Vendor ID:          GenuineIntel
BIOS Vendor ID:     Intel
Model name:         Intel(R) Xeon(R) 6760P
BIOS Model name:    Intel(R) Xeon(R) 6760P   CPU @ 2.2GHz
BIOS CPU family:    179
CPU family:         6
Model:              173
Thread(s) per core: 2
Core(s) per socket: 64
Socket(s):          2
Stepping:           1
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 aperfmperf tsc_known_freq pni
pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcmm 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
```

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Platform Notes (Continued)

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
arat pln pts hfi vnni 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_lid 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):

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)

8 MiB (128 instances)

256 MiB (128 instances)

640 MiB (2 instances)

4

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, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150
, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184,
186, 188, 190

64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106
, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 192, 194, 196, 198, 200, 202, 204,
206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 2
40, 242, 244, 246, 248, 250, 252, 254

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, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151
, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185,
187, 189, 191

65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107
, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 193, 195, 197, 199, 201, 203, 205,
207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 2
41, 243, 245, 247, 249, 251, 253, 255

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;

PBRSE-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	6M	12	Data	1	64	1	64
L1i	64K	8M	16	Instruction	1	64	1	64
L2	2M	256M	16	Unified	2	2048	1	64
L3	320M	640M	16	Unified	3	327680	1	64

8. numactl --hardware

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

available: 4 nodes (0-3)

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Platform Notes (Continued)

```
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, 128, 130, 132, 134,
136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188
, 190
node 0 size: 128532 MB
node 0 free: 127608 MB
node 1 cpus:
64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 1
26, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242,
244, 246, 248, 250, 252, 254
node 1 size: 129007 MB
node 1 free: 128351 MB
node 2 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, 129, 131, 133, 135,
137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189
, 191
node 2 size: 128968 MB
node 2 free: 127894 MB
node 3 cpus:
65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 1
27, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243,
245, 247, 249, 251, 253, 255
node 3 size: 128567 MB
node 3 free: 117659 MB
node distances:
node   0   1   2   3
  0:  10  12  21  21
  1:  12  10  21  21
  2:  21  21  10  12
  3:  21  21  12  10
```

```
-----
9. /proc/meminfo
MemTotal:      527438316 kB
```

```
-----
10. who -r
run-level 3 Mar 25 20:36
```

```
-----
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          YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager firewalld getty@
irqbalance issue-generator kbdsettings kdump kdump-early kdump-notify 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 ebtables exchange-bmc-os-info fsidd
gpm grub2-once haveged ipmi ipmievdev 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-sysextd systemd-time-wait-sync systemd-timesyncd udisks2 vncserver@

indirect         systemd-userdbd wickedd
```

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Platform Notes (Continued)

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

```
BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=a2bcd2c3-ec40-4e98-a1b4-9c2707cdaa5a
splash=silent
mitigations=auto
quiet
security=apparmor
crashkernel=363M,high
crashkernel=72M,low
```

14. cpupower frequency-info

```
analyzing CPU 117:
  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

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Platform Notes (Continued)

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	140G	5.0G	136G	4%	/mnt/ramdisk

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

Vendor: Dell Inc.
Product: PowerEdge R670
Product Family: PowerEdge
Serial: DNN3108

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:

1x 002C0423002C MTC20F2085S1RC64BD2 UXCC 32 GB 2 rank 6400
1x 002C069D002C MTC20F2085S1RC64BD1 USFF 32 GB 2 rank 6400
14x 00AD063200AD HMC888AHBRA286N 32 GB 2 rank 6400

22. BIOS

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

BIOS Vendor: Dell Inc.
BIOS Version: 1.2.6
BIOS Date: 02/26/2025
BIOS Revision: 1.2

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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SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

SPECrate®2017_fp_base = 1410

PowerEdge R670 (Intel Xeon 6760P)

SPECrate®2017_fp_peak = 1460

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024

Compiler Version Notes (Continued)

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

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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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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



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Hardware Availability: Mar-2025

Software Availability: Jun-2024

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 -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

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Software Availability: Jun-2024

Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):

-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
-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

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Peak Optimization Flags (Continued)

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 -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: -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:

521.wrf_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

527.cam4_r: basepeak = yes

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
-mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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Peak Optimization Flags (Continued)

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
```

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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