



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

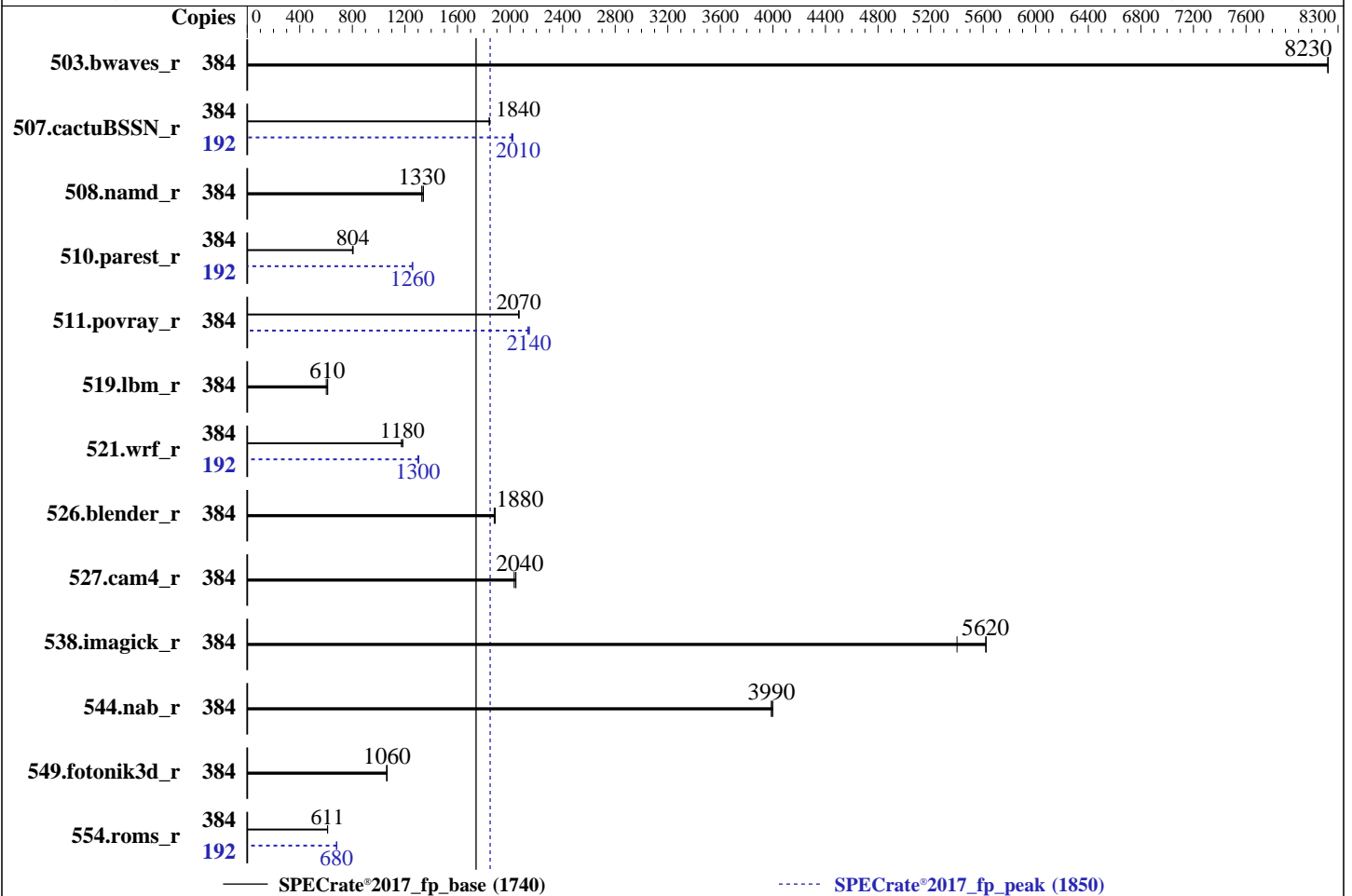
Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Platinum 8468H
 Max MHz: 3800
 Nominal: 2100
 Enabled: 192 cores, 4 chips, 2 threads/core
 Orderable: 1, 2, 4 chip(s)
 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: 1 TB (32 x 32 GB 2Rx8 PC5-4800B-R)
 Storage: 1 x 480 GB SATA SSD
 Other: None

Software

OS: Ubuntu 22.04.1 LTS
 Kernel 5.15.0-43-generic
 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: No
 Firmware: HPE BIOS Version v1.30 03/01/2023 released Mar-2023
 File System: ext4
 System State: Run level 5 (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



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	384	468	8220	468	8230	468	8230	384	468	8220	468	8230	468	8230
507.cactuBSSN_r	384	264	1840	264	1840	264	1840	192	121	2010	120	2020	121	2010
508.namd_r	384	275	1330	274	1330	272	1340	384	275	1330	274	1330	272	1340
510.parest_r	384	1249	804	1254	801	1248	805	192	399	1260	399	1260	400	1250
511.povray_r	384	434	2070	433	2070	434	2060	384	418	2140	420	2140	418	2150
519.lbm_r	384	673	601	663	610	661	613	384	673	601	663	610	661	613
521.wrf_r	384	734	1170	728	1180	727	1180	192	329	1310	331	1300	331	1300
526.blender_r	384	310	1880	310	1890	311	1880	384	310	1880	310	1890	311	1880
527.cam4_r	384	331	2030	328	2040	329	2040	384	331	2030	328	2040	329	2040
538.imagick_r	384	177	5400	170	5620	170	5620	384	177	5400	170	5620	170	5620
544.nab_r	384	162	3990	162	3990	162	4000	384	162	3990	162	3990	162	4000
549.fotonik3d_r	384	1412	1060	1406	1060	1406	1060	384	1412	1060	1406	1060	1406	1060
554.roms_r	384	997	612	999	611	999	611	192	449	680	449	679	447	682

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

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"
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>
IRQ balance service was stopped using "systemctl stop irqbalance.service"
tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"
perf-bias for all the CPUs is set using "cpupower set -b 0"
```

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4

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.

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>

Platform Notes

The system ROM used for this result contains Intel microcode version 0x2b0001b0 for the Intel Xeon Platinum 8468H Processor

BIOS Configuration

Workload Profile set to General Throughput Compute

Memory Patrol Scrubbing set to Disabled

Last Level Cache (LLC) Dead Line Allocation set to Disabled

Enhanced Processor Performance Profile set to Aggressive

Thermal Configuration set to Maximum Cooling

Workload Profile set to Custom

Adjacent Sector Prefetch set to Disabled

DCU Stream Prefetcher set to Disabled

Minimum Processor Idle Power Package C-State set to Package C6 (non-retention) State

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on admin1 Fri Apr 28 00:41:47 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 249 (249.11-0ubuntu3.4)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Platform Notes (Continued)

24. BIOS

1. uname -a

```
Linux admin1 5.15.0-43-generic #46-Ubuntu SMP Tue Jul 12 10:30:17 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
```

2. w

```
00:41:47 up 44 min, 3 users, load average: 0.01, 0.03, 0.00
USER      TTY      FROM          LOGIN@      IDLE        JCPU      PCPU      WHAT
admin1    tty1     -             27Jun22    304days    0.04s     0.00s    -bash
admin1    pts/0    172.16.0.100 27Jun22    304days    0.13s     0.01s    sshd: admin1 [priv]
admin1    pts/1    172.16.0.100 27Jun22    11.00s     1.02s     0.13s    sudo -i
```

3. Username

```
From environment variable $USER:  root
From the command 'logname':      admin1
```

4. ulimit -a

```
time(seconds)      unlimited
file(blocks)        unlimited
data(kbytes)        unlimited
stack(kbytes)       unlimited
coredump(blocks)    0
memory(kbytes)      unlimited
locked memory(kbytes) 132050020
process             4126124
nofiles             1024
vmemory(kbytes)     unlimited
locks               unlimited
rtprio              0
```

5. sysinfo process ancestry

```
/sbin/init
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: admin1 [priv]
sshd: admin1@pts/0
-bash
sudo -i
sudo -i
-bash
-bash
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=384 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=192 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=384 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=192 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
--runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.001/tempslogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) Platinum 8468H
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Platform Notes (Continued)

```

vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping      : 6
microcode     : 0x2b0001b0
bugs          : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores     : 48
siblings      : 96
4 physical ids (chips)
384 processors (hardware threads)
physical id 0: core ids 0-47
physical id 1: core ids 0-47
physical id 2: core ids 0-47
physical id 3: core ids 0-47
physical id 0: apicids 0-95
physical id 1: apicids 128-223
physical id 2: apicids 256-351
physical id 3: apicids 384-479

```

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 2.37.2:

```

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):                384
On-line CPU(s) list:  0-383
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Platinum 8468H
CPU family:            6
Model:                 143
Thread(s) per core:   2
Core(s) per socket:   48
Socket(s):             4
Stepping:              6
BogoMIPS:              4200.00
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 vmmx 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
                      invpcid_single cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                      vnmi 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 amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d
                      arch_capabilities
Virtualization:        VT-x
L1d cache:             9 MiB (192 instances)

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Platform Notes (Continued)

```

L1i cache:          6 MiB (192 instances)
L2 cache:          384 MiB (192 instances)
L3 cache:          420 MiB (4 instances)
NUMA node(s):      16
NUMA node0 CPU(s): 0-11,192-203
NUMA node1 CPU(s): 12-23,204-215
NUMA node2 CPU(s): 24-35,216-227
NUMA node3 CPU(s): 36-47,228-239
NUMA node4 CPU(s): 48-59,240-251
NUMA node5 CPU(s): 60-71,252-263
NUMA node6 CPU(s): 72-83,264-275
NUMA node7 CPU(s): 84-95,276-287
NUMA node8 CPU(s): 96-107,288-299
NUMA node9 CPU(s): 108-119,300-311
NUMA node10 CPU(s): 120-131,312-323
NUMA node11 CPU(s): 132-143,324-335
NUMA node12 CPU(s): 144-155,336-347
NUMA node13 CPU(s): 156-167,348-359
NUMA node14 CPU(s): 168-179,360-371
NUMA node15 CPU(s): 180-191,372-383
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs 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	9M	12	Data	1	64	1	64
L1i	32K	6M	8	Instruction	1	64	1	64
L2	2M	384M	16	Unified	2	2048	1	64
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: 0-11,192-203
node 0 size: 64092 MB
node 0 free: 63706 MB
node 1 cpus: 12-23,204-215
node 1 size: 64506 MB
node 1 free: 64286 MB
node 2 cpus: 24-35,216-227
node 2 size: 64506 MB
node 2 free: 64089 MB
node 3 cpus: 36-47,228-239
node 3 size: 64506 MB
node 3 free: 64038 MB
node 4 cpus: 48-59,240-251
node 4 size: 64506 MB
node 4 free: 63960 MB
node 5 cpus: 60-71,252-263
node 5 size: 64506 MB
node 5 free: 64284 MB

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

Platform Notes (Continued)

```

node 6 cpus: 72-83,264-275
node 6 size: 64506 MB
node 6 free: 64283 MB
node 7 cpus: 84-95,276-287
node 7 size: 64506 MB
node 7 free: 64283 MB
node 8 cpus: 96-107,288-299
node 8 size: 64506 MB
node 8 free: 64196 MB
node 9 cpus: 108-119,300-311
node 9 size: 64506 MB
node 9 free: 64164 MB
node 10 cpus: 120-131,312-323
node 10 size: 64506 MB
node 10 free: 64277 MB
node 11 cpus: 132-143,324-335
node 11 size: 64506 MB
node 11 free: 64290 MB
node 12 cpus: 144-155,336-347
node 12 size: 64506 MB
node 12 free: 64108 MB
node 13 cpus: 156-167,348-359
node 13 size: 64472 MB
node 13 free: 63887 MB
node 14 cpus: 168-179,360-371
node 14 size: 64506 MB
node 14 free: 64281 MB
node 15 cpus: 180-191,372-383
node 15 size: 64495 MB
node 15 free: 64268 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
0:  10  20  30  30  30  30  30  30  30  30  30  30  30  30  30  30
1:  20  10  30  30  30  30  30  30  30  30  30  30  30  30  30  30
2:  30  30  10  20  30  30  30  30  30  30  30  30  30  30  30  30
3:  30  30  20  10  30  30  30  30  30  30  30  30  30  30  30  30
4:  30  30  30  30  10  20  30  30  30  30  30  30  30  30  30  30
5:  30  30  30  30  20  10  30  30  30  30  30  30  30  30  30  30
6:  30  30  30  30  30  30  10  20  30  30  30  30  30  30  30  30
7:  30  30  30  30  30  30  20  10  30  30  30  30  30  30  30  30
8:  30  30  30  30  30  30  30  30  10  20  30  30  30  30  30  30
9:  30  30  30  30  30  30  30  30  20  10  30  30  30  30  30  30
10: 30  30  30  30  30  30  30  30  30  30  10  20  30  30  30  30
11: 30  30  30  30  30  30  30  30  30  30  20  10  30  30  30  30
12: 30  30  30  30  30  30  30  30  30  30  30  30  10  20  30  30
13: 30  30  30  30  30  30  30  30  30  30  30  30  20  10  30  30
14: 30  30  30  30  30  30  30  30  30  30  30  30  30  30  10  20
15: 30  30  30  30  30  30  30  30  30  30  30  30  30  20  10  10

```

```

-----
9. /proc/meminfo
   MemTotal:      1056400184 kB

```

```

-----
10. who -r
    run-level 5 Jun 27 18:30

```

```

-----
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.4)
    Default Target Status

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Platform Notes (Continued)

graphical degraded

12. Failed units, from systemctl list-units --state=failed

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* systemd-networkd-wait-online.service	loaded	failed	failed	Wait for Network to be Configured

13. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager apparmor blk-availability cloud-config cloud-final cloud-init cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager grub-common grub-initrd-fallback irqbalance keyboard-setup lvm2-monitor lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald tuned ua-reboot-cmds ubuntu-advantage udisks2 ufw unattended-upgrades vgauth
enabled-runtime	netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
disabled	console-getty debug-shell iscsid nftables powertop rsync serial-getty@ systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync upower
generated	apport
indirect	uuid
masked	cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo x11-common

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

BOOT_IMAGE=/vmlinuz-5.15.0-43-generic
root=/dev/mapper/ubuntu--vg-ubuntu--lv
ro

15. cpupower frequency-info

analyzing CPU 0:
Unable to determine current policy
boost state support:
Supported: yes
Active: yes

16. tuned-adm active

Current active profile: throughput-performance

17. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	2
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
vm.dirty_bytes	0
vm.dirty_expire_centisecs	3000
vm.dirty_ratio	40
vm.dirty_writeback_centisecs	500
vm.dirtytime_expire_seconds	43200
vm.extfrag_threshold	500
vm.min_unmapped_ratio	1
vm.nr_hugepages	0
vm.nr_hugepages_mempolicy	0

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Platform Notes (Continued)

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

```
-----
18. /sys/kernel/mm/transparent_hugepage
defrag          always defer defer+madvise [madvise] never
enabled         always [madvise] never
hpage_pmd_size  2097152
shmem_enabled   always within_size advise [never] deny force
```

```
-----
19. /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
```

```
-----
20. OS release
From /etc/*-release /etc/*-version
os-release Ubuntu 22.04.1 LTS
```

```
-----
21. Disk information
SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/ubuntu--vg-ubuntu--lv ext4  98G   19G   75G  20% /
```

```
-----
22. /sys/devices/virtual/dmi/id
Vendor:          HPE
Product:         ProLiant DL560 Gen11
Product Family: ProLiant
Serial:          CNX22605RZ
```

```
-----
23. 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:
 28x Hynix HMC88AEBRA168N 32 GB 2 rank 4800
  3x Hynix HMC88MEBRA113N 32 GB 2 rank 4800
  1x Hynix HMC88MEBRA115N 32 GB 2 rank 4800
 32x UNKNOWN NOT AVAILABLE
```

```
-----
24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:      HPE
BIOS Version:     1.30
BIOS Date:        03/01/2023
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

Platform Notes (Continued)

BIOS Revision: 1.30
Firmware Revision: 1.20

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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
=====

=====
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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
=====

=====
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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
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++, C, Fortran | 507.cactuBSSN_r(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.
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.
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.
=====

=====
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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
=====

=====
Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(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.
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.
=====



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

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
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

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

Base Optimization Flags (Continued)

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  
-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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

Peak Compiler Invocation (Continued)

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

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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

Peak Optimization Flags (Continued)

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
```

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/HPE-Platform-Flags-Intel-SPR-rev1.2.html>

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

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.xml>

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



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen11

(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 1740

SPECrate®2017_fp_peak = 1850

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2023-04-27 20:41:47-0400.

Report generated on 2023-05-23 19:09:06 by CPU2017 PDF formatter v6716.

Originally published on 2023-05-23.