



SPEC CPU®2026 Floating Point Rate Result

Copyright 2026 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL320 Gen12

(2.00 GHz, Intel Xeon 6787P)

SPECrate®2026_fp_base = 315

SPECrate®2026_fp_peak = 315

CPU2026 License: 3

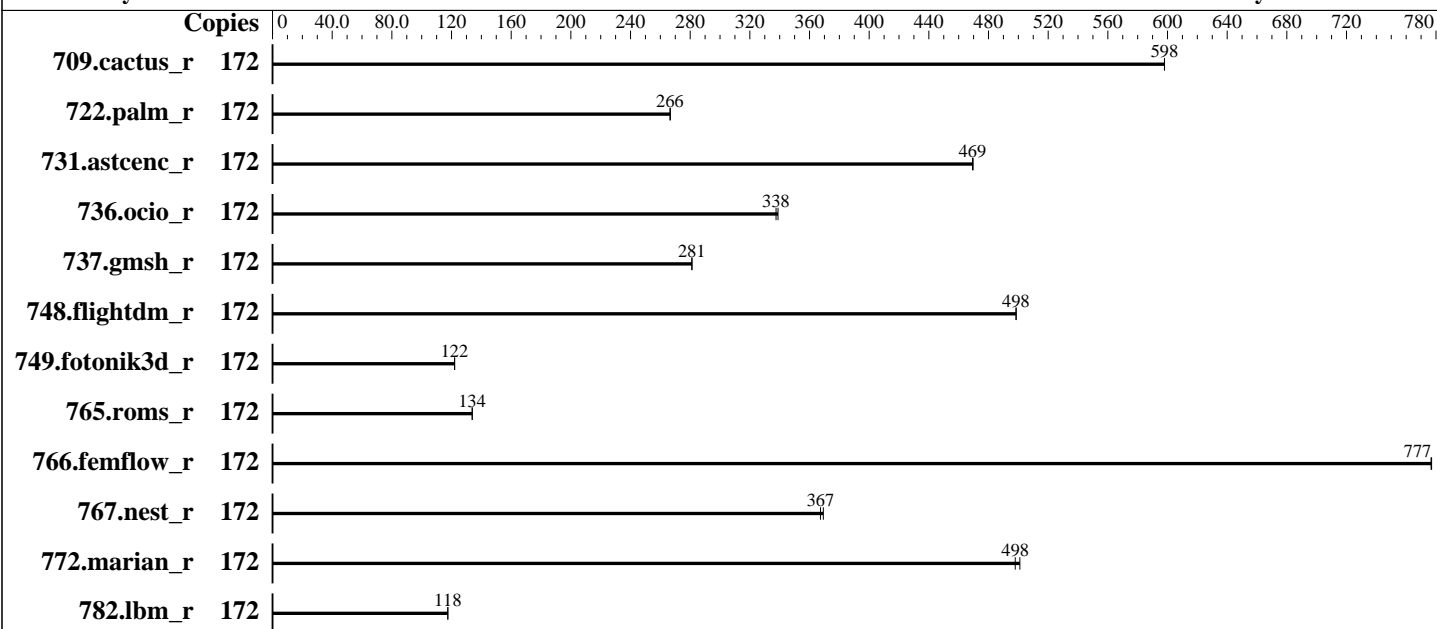
Test Sponsor: HPE

Tested by: HPE

Test Date: Feb-2026

Hardware Availability: Mar-2025

Software Availability: Jan-2026



Hardware

CPU Name: Intel Xeon 6787P
 Max MHz: 3800
 Nominal: 2000
 Enabled: 86 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: 336 MB I+D on chip per chip
 Other: None
 Memory: 512 GB (8 x 64 GB 2Rx4 PC5-6400B-R)
 Storage: 1 x 1.6 TB NVMe SSD
 Cooling: CLC
 Other: None

Software

OS: Ubuntu 24.04.3 LTS
 Kernel 6.8.0-90-generic
 Compiler: C/C++: Version 2025.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2025.3 of Intel Fortran Compiler for Linux
 Compiler Category: Vendor
 Firmware: HPE BIOS Version v1.60 released Jan-2026
 File System: ext4
 System State: Run level 5 (multi-user, graphical)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: jemalloc memory allocator v5.3
 Power Management: BIOS is 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
709.cactus_r	172	247	598	247	598			172	247	598	247	598		
722.palm_r	172	852	266	851	267			172	852	266	851	267		
731.ascenc_r	172	308	470	308	469			172	308	470	308	469		
736.ocio_r	172	446	338	444	339			172	446	338	444	339		
737.gmsh_r	172	281	281	281	281			172	281	281	281	281		
748.flightdm_r	172	247	499	247	498			172	247	499	247	498		
749.fotonik3d_r	172	1628	122	1630	122			172	1628	122	1630	122		
765.roms_r	172	2024	134	2023	134			172	2024	134	2023	134		
766.femflow_r	172	325	777	325	777			172	325	777	325	777		
767.nest_r	172	371	367	369	369			172	371	367	369	369		
772.marian_r	172	542	501	545	498			172	542	501	545	498		
782.lbm_r	172	838	118	839	118			172	838	118	839	118		

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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"
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>
```

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2026/lib"
MALLOC_CONF = "retain:true"



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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

BIOS Configurations : Parameters are selected in the order shown below

Workload Profile set to General Throughput Compute

Enhanced Processor Performance Profile set to Aggressive

Thermal Configuration set to Maximum Cooling

Memory Patrol Scrubbing set to Disabled

Last Level Cache (LLC) Prefetch set to Enabled

XPT Prefetch set to Disabled

Workload Profile set to Custom

DCU Stream Prefetcher set to Disabled

Adjacent Sector Prefetch set to Disabled

Sysinfo program /home/cpu2026/bin/sysinfo

Rev: 069f95da7e7f5d81b2ce48a82150e54f

running on admin1 Wed Feb 4 11:54:28 2026

SUT (System Under Test) info as seen by some common utilities.

Table of contents

1. `uname -srvm`
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 255 (255.4-lubuntu8.12)`
12. Services, from `systemctl list-unit-files`

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Platform Notes (Continued)

- 13. Linux kernel boot-time arguments, from /proc/cmdline
- 14. cpupower frequency-info
- 15. tuned-adm active
- 16. sysctl
- 17. /sys/kernel/mm/transparent_hugepage
- 18. /sys/kernel/mm/transparent_hugepage/khugepaged
- 19. OS release
- 20. Disk information
- 21. /sys/devices/virtual/dmi/id
- 22. dmidecode
- 23. BIOS

```
-----
1. uname -srvrn
Linux 6.8.0-90-generic #91-Ubuntu SMP PREEMPT_DYNAMIC Tue Nov 18 14:14:30 UTC 2025 x86_64
-----
```

```
-----
2. w
11:54:28 up 2:43, 3 users, load average: 126.18, 160.43, 165.59
USER      TTY      FROM          LOGIN@      IDLE        JCPU      PCPU      WHAT
admin1    tty1    172.16.0.100  09:47      2:43m      0.00s     0.01s     sshd: admin1 [priv]
admin1    tty1    172.16.0.100  09:15      2:43m      0.00s     0.02s     sshd: admin1 [priv]
admin1    tty1    -             09:15      2:39m      0.03s     0.01s     -bash
-----
```

```
-----
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) 66009524
process            2062478
nofiles            1024
vmemory(kbytes)    unlimited
locks              unlimited
rtprio             0
-----
```

```
-----
5. sysinfo process ancestry
-----
```

(Continued on next page)



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Platform Notes (Continued)

```

/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 --reportable --action validate --define default-platform-flags --copies 172 -c
ic2025.3-sapphirerapids-cpu2026-0.902-rate-20260121.cfg --define smt-on --define cores=86 --define
physicalfirst --define invoke_with_interleave --define drop_caches --tune base -o all fprate
runcpu --nobuild --reportable --action validate --define default-platform-flags --copies 172 --configfile
ic2025.3-sapphirerapids-cpu2026-0.902-rate-20260121.cfg --define smt-on --define cores=86 --define
physicalfirst --define invoke_with_interleave --define drop_caches --tune base --output_format all
--nopower --runmode rate --tune base --size refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2026.008/templogs/preenv.fprate.008.0.log --lognum 008.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2026

```

```

-----
6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) 6787P
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 173
   stepping        : 1
   microcode       : 0x1000411
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi vmscape
   cpu cores       : 86
   siblings        : 172
   1 physical ids (chips)
   172 processors (hardware threads)
   physical id 0: core ids 0-42,64-106
   physical id 0: apicids 0-85,128-213

```

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):            172

```

(Continued on next page)



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Platform Notes (Continued)

```

On-line CPU(s) list:          0-171
Vendor ID:                    GenuineIntel
BIOS Vendor ID:              Intel(R) Corporation
Model name:                   Intel(R) Xeon(R) 6787P
BIOS Model name:             Intel(R) Xeon(R) 6787P  CPU @ 2.0GHz
BIOS CPU family:             179
CPU family:                   6
Model:                        173
Thread(s) per core:          2
Core(s) per socket:          86
Socket(s):                    1
Stepping:                     1
CPU(s) scaling MHz:          22%
CPU max MHz:                  3800.0000
CPU min MHz:                  800.0000
BogoMIPS:                     4000.00
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 cdp_l2 ssbd mba
                               ibrs ibpb stibp ibrs_enhanced tpr_shadow 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
                               user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts hwp
                               hwp_act_window hwp_epp hwp_pkg_req 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_lld
                               arch_capabilities ibpb_exit_to_user
Virtualization:                VT-x
L1d cache:                     4 MiB (86 instances)
L1i cache:                     5.4 MiB (86 instances)
L2 cache:                      172 MiB (86 instances)
L3 cache:                      336 MiB (1 instance)
NUMA node(s):                  2
NUMA node0 CPU(s):             0-42,86-128
NUMA node1 CPU(s):             43-85,129-171
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:   Not affected
Vulnerability L1tf:            Not affected

```

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Platform Notes (Continued)

Vulnerability Mds: Not affected
 Vulnerability Meltdown: Not affected
 Vulnerability Mmio stale data: Not affected
 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/swaps barriers and __user pointer sanitization
 Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling; PBRSE-eIBRS Not affected; BHI BHI_DIS_S
 Vulnerability Srbds: Not affected
 Vulnerability Tsx async abort: Not affected
 Vulnerability Vmscape: Mitigation; IBPB before exit to userspace

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	4M	12	Data	1	64	1	64
L1i	64K	5.4M	16	Instruction	1	64	1	64
L2	2M	172M	16	Unified	2	2048	1	64
L3	336M	336M	16	Unified	3	344064	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: 0-42,86-128
node 0 size: 257732 MB
node 0 free: 243960 MB
node 1 cpus: 43-85,129-171
node 1 size: 257967 MB
node 1 free: 244955 MB
node distances:
node  0  1
  0:  10 12
  1:  12 10
```

9. /proc/meminfo

MemTotal: 528076192 kB

10. who -r

run-level 5 Feb 4 09:11

11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.12)

Default Target Status

(Continued on next page)



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Platform Notes (Continued)

graphical running

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager apparmor appport 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 keyboard-setup lvm2-monitor multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db setvtrgb snapd sysstat 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 rsync serial-getty@ ssh systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-networkd-wait-online@ systemd-pcrlock-file-system systemd-pcrlock-firmware-code systemd-pcrlock-firmware-config systemd-pcrlock-machine-id systemd-pcrlock-make-policy systemd-pcrlock-secureboot-authority systemd-pcrlock-secureboot-policy systemd-sysext systemd-time-wait-sync upower
indirect	systemd-sysupdate systemd-sysupdate-reboot uidd
masked	cryptdisks cryptdisks-early hwclock multipath-tools-boot screen-cleanup sudo x11-common

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

BOOT_IMAGE=/boot/vmlinuz-6.8.0-90-generic
root=UUID=357b2269-28cb-4461-ad44-646338b204c8
ro

14. cpupower frequency-info

analyzing CPU 94:
 current policy: frequency should be within 800 MHz and 3.80 GHz.
 The governor "powersave" may decide which speed to use within this range.

 boost state support:
 Supported: yes
 Active: yes

15. tuned-adm active

Current active profile: balanced

16. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	2
vm.compaction_proactiveness	20

(Continued on next page)



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Platform Notes (Continued)

```

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

```

```

-----
17. /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

```

```

-----
18. /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

```

```

-----
19. OS release
From /etc/*-release /etc/*-version
os-release Ubuntu 24.04.3 LTS

```

```

-----
20. Disk information
SPEC is set to: /home/cpu2026
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p2 ext4  1.5T  155G  1.3T  12% /

```

```

-----
21. /sys/devices/virtual/dmi/id

```

(Continued on next page)



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Platform Notes (Continued)

Vendor: HPE
 Product: HPE ProLiant Compute DL320 Gen12
 Product Family: ProLiant
 Serial: S84PQDRU0T

22. dmidecode

Additional information from dmidecode 3.5 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:

7x Hynix HMCG94AHBRA480N 64 GB 2 rank 6400
 1x Hynix HMCG94AHBRA487N 64 GB 2 rank 6400

23. BIOS

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

BIOS Vendor: HPE
 BIOS Version: 1.60
 BIOS Date: 01/09/2026
 BIOS Revision: 1.60
 Firmware Revision: 1.19

Compiler Version Notes

```
=====  
C      | 782.lbm_r(base)  
-----
```

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2025.3.0 Build 20251010  
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.  
-----
```

```
=====  
C++   | 731.astcenc_r(base) 736.ocio_r(base) 748.flightdm_r(base)  
      | 766.femflow_r(base) 767.nest_r(base) 772.marian_r(base)  
-----
```

```
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2025.3.0 Build 20251010  
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.  
-----
```

```
=====  
C++, C | 709.cactus_r(base) 737.gmsh_r(base)  
-----
```

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Compiler Version Notes (Continued)

```
-----
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2025.3.0 Build 20251010
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
-----
```

```
=====
Fortran | 722.palm_r(base) 749.fotonik3d_r(base) 765.roms_r(base)
-----
```

```
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2025.3.0 Build 20251010
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
-----
```

Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both C and C++:

icpx icx

Base Portability Flags

```
709.cactus_r: -DSPEC_LP64
722.palm_r: -DSPEC_LP64
731.ascenc_r: -DSPEC_LP64
736.ocio_r: -DSPEC_LP64
737.gmsh_r: -DSPEC_LP64 -fno-associative-math
748.flightdm_r: -DSPEC_LP64
749.fotonik3d_r: -DSPEC_LP64
765.roms_r: -DSPEC_LP64
766.femflow_r: -DSPEC_LP64
767.nest_r: -DSPEC_LP64
772.marian_r: -DSPEC_LP64
782.lbm_r: -DSPEC_LP64
```



SPEC CPU®2026 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL320 Gen12

(2.00 GHz, Intel Xeon 6787P)

SPECrate®2026_fp_base = 315

SPECrate®2026_fp_peak = 315

CPU2026 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Feb-2026

Hardware Availability: Mar-2025

Software Availability: Jan-2026

Base Optimization Flags

C benchmarks:

```
-m64 -std=c18 -Wl,-z,muldefs -xsapphirerapids
-mprefer-vector-width=512 -O3 -ffp-model=fast -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -L/usr/local/jemalloc-5.3.0/lib
-ljemalloc
```

C++ benchmarks:

```
-m64 -std=c++17 -Wl,-z,muldefs -xsapphirerapids
-mprefer-vector-width=512 -O3 -ffp-model=fast -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -L/usr/local/jemalloc-5.3.0/lib
-ljemalloc
```

Fortran benchmarks:

```
-m64 -stand f18 -Wl,-z,muldefs -xsapphirerapids
-mprefer-vector-width=512 -O3 -ffp-model=fast -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc-5.3.0/lib -ljemalloc
```

Benchmarks using both C and C++:

```
-m64 -std=c++17 -std=c18 -Wl,-z,muldefs -xsapphirerapids
-mprefer-vector-width=512 -O3 -ffp-model=fast -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -L/usr/local/jemalloc-5.3.0/lib
-ljemalloc
```

Peak Optimization Flags

C benchmarks:

782.lbm_r: basepeak = yes

C++ benchmarks:

731.ascenc_r: basepeak = yes

736.ocio_r: basepeak = yes

748.flightdm_r: basepeak = yes

766.femflow_r: basepeak = yes

767.nest_r: basepeak = yes

772.marian_r: basepeak = yes

(Continued on next page)



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Peak Optimization Flags (Continued)

Fortran benchmarks:

722.palm_r: basepeak = yes

749.fotonik3d_r: basepeak = yes

765.roms_r: basepeak = yes

Benchmarks using both C and C++:

709.cactus_r: basepeak = yes

737.gmsh_r: basepeak = yes

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

<http://www.spec.org/cpu2026/results/flags/HPE-Platform-Flags-Intel-GNR-rev1.4.html>

<http://www.spec.org/cpu2026/results/flags/Intel-ic2025-official-linux64-cpu2026-0.902.html>

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

<http://www.spec.org/cpu2026/results/flags/HPE-Platform-Flags-Intel-GNR-rev1.4.xml>

<http://www.spec.org/cpu2026/results/flags/Intel-ic2025-official-linux64-cpu2026-0.902.xml>

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