



# SPEC CPU®2017 Integer Rate Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant Compute DL320 Gen12**

(2.10 GHz, Intel Xeon 6740P)

**SPECrate®2017\_int\_base = 495**

**SPECrate®2017\_int\_peak = 510**

**CPU2017 License:** 3

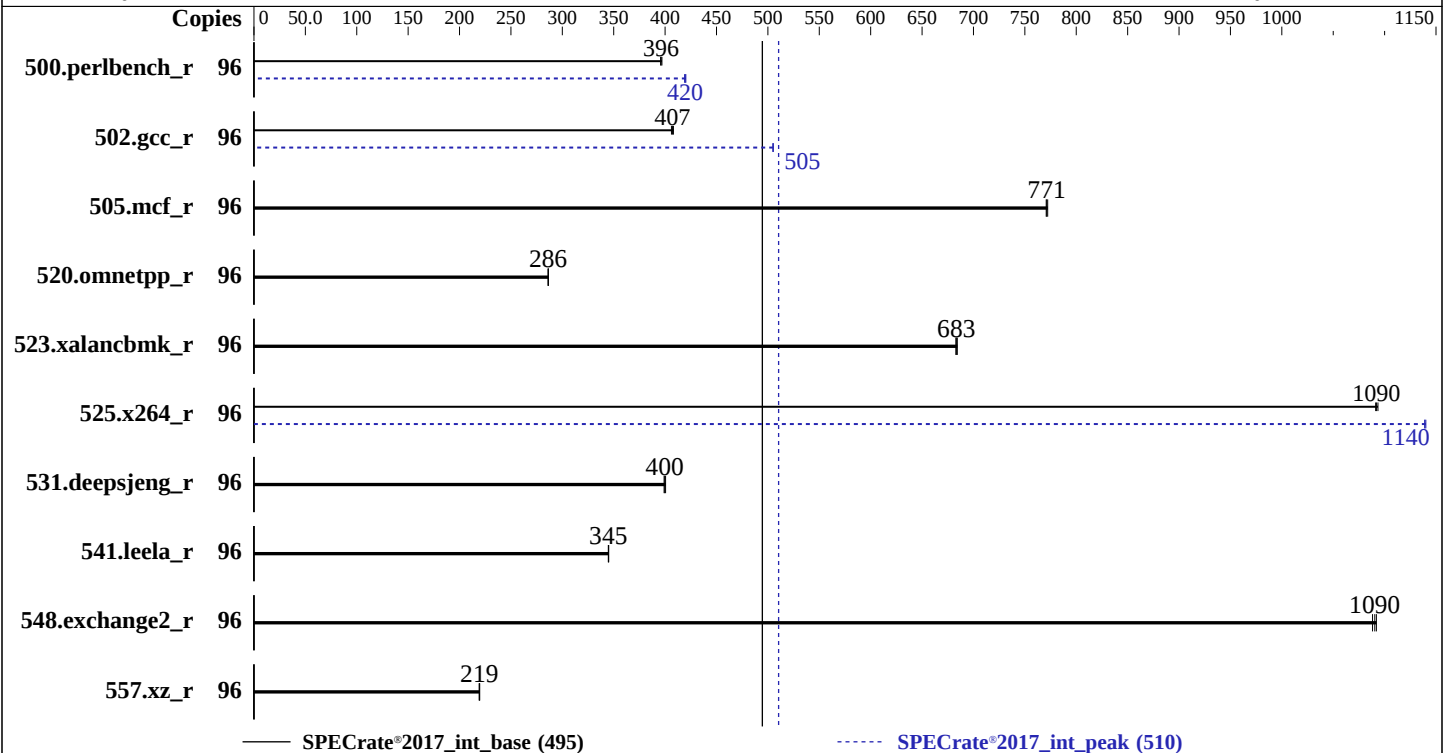
**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Mar-2025

**Hardware Availability:** Mar-2025

**Software Availability:** Jun-2024



## Hardware

CPU Name: Intel Xeon 6740P  
Max MHz: 3800  
Nominal: 2100  
Enabled: 48 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: 288 MB I+D on chip per chip  
Other: None  
Memory: 256 GB (8 x 32 GB 2Rx8 PC5-6400B-R)  
Storage: 1 x 1.2 TB NVMe SSD  
Other: CPU Cooling: Air

## Software

OS: SUSE Linux Enterprise Server 15 SP6  
Kernel 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: HPE BIOS Version v1.20 02/14/2025 released Feb-2025  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-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              |
| 500.perlbench_r | 96     | 385               | 397                | 386               | 396                | <b><u>386</u></b> | <b><u>396</u></b> | 96     | <b><u>364</u></b> | <b><u>420</u></b> | 364               | 420                | 365               | 419                |
| 502.gcc_r       | 96     | <b><u>334</u></b> | <b><u>407</u></b>  | 333               | 408                | 335               | 406               | 96     | 269               | 505               | 269               | 505                | <b><u>269</u></b> | <b><u>505</u></b>  |
| 505.mcf_r       | 96     | 201               | 771                | 201               | 772                | <b><u>201</u></b> | <b><u>771</u></b> | 96     | 201               | 771               | 201               | 772                | <b><u>201</u></b> | <b><u>771</u></b>  |
| 520.omnetpp_r   | 96     | <b><u>440</u></b> | <b><u>286</u></b>  | 440               | 286                | 440               | 286               | 96     | <b><u>440</u></b> | <b><u>286</u></b> | 440               | 286                | 440               | 286                |
| 523.xalancbmk_r | 96     | 148               | 683                | <b><u>148</u></b> | <b><u>683</u></b>  | 148               | 684               | 96     | 148               | 683               | <b><u>148</u></b> | <b><u>683</u></b>  | 148               | 684                |
| 525.x264_r      | 96     | <b><u>154</u></b> | <b><u>1090</u></b> | 154               | 1090               | 154               | 1090              | 96     | 148               | 1140              | 147               | 1140               | <b><u>148</u></b> | <b><u>1140</u></b> |
| 531.deepsjeng_r | 96     | <b><u>275</u></b> | <b><u>400</u></b>  | 276               | 399                | 275               | 400               | 96     | <b><u>275</u></b> | <b><u>400</u></b> | 276               | 399                | 275               | 400                |
| 541.leela_r     | 96     | 461               | 345                | <b><u>461</u></b> | <b><u>345</u></b>  | 461               | 345               | 96     | 461               | 345               | <b><u>461</u></b> | <b><u>345</u></b>  | 461               | 345                |
| 548.exchange2_r | 96     | 231               | 1090               | <b><u>231</u></b> | <b><u>1090</u></b> | 230               | 1090              | 96     | 231               | 1090              | <b><u>231</u></b> | <b><u>1090</u></b> | 230               | 1090               |
| 557.xz_r        | 96     | 472               | 220                | 473               | 219                | <b><u>473</u></b> | <b><u>219</u></b> | 96     | 472               | 220               | 473               | 219                | <b><u>473</u></b> | <b><u>219</u></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 = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"

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

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>



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## Platform Notes

### BIOS Configuration:

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/cpu2017/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on localhost Sat Mar 8 12:12:31 2025

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

### Table of contents

1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
  10. who -r
  11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
  12. Services, from systemctl list-unit-files
  13. Linux kernel boot-time arguments, from /proc/cmdline
  14. cpupower frequency-info
  15. sysctl
  16. /sys/kernel/mm/transparent\_hugepage
  17. /sys/kernel/mm/transparent\_hugepage/khugepaged
  18. OS release
  19. Disk information
  20. /sys/devices/virtual/dmi/id
  21. dmidecode
  22. BIOS
- 
1. uname -a  
Linux localhost 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  
12:12:31 up 3 min, 3 users, load average: 0.68, 0.50, 0.24  
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
- 
3. Username  
From environment variable \$USER: root
- 
4. ulimit -a

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## Platform Notes (Continued)

```
core file size      (blocks, -c) unlimited
data seg size      (kbytes, -d) unlimited
scheduling priority      (-e) 0
file size          (blocks, -f) unlimited
pending signals     (-i) 1030660
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) 1030660
virtual memory      (kbytes, -v) unlimited
file locks         (-x) unlimited
```

### 5. sysinfo process ancestry

```
/usr/lib/systemd/systemd --switched-root --system --deserialize=31
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@notty
bash -c cd $SPEC/ && $SPEC/intratespron.sh
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=96 -c
ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=48 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak -o all intrate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=96 --configfile
ic2024.1-lin-sapphirerapids-rate-20240308.cfg --define smt-on --define cores=48 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
--runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.006/templogs/preenv.intrate.006.0.log --lognum 006.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

### 6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) 6740P
vendor_id       : GenuineIntel
cpu family      : 6
model           : 173
stepping        : 1
microcode       : 0x1000380
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
cpu cores       : 48
siblings        : 96
1 physical ids (chips)
96 processors (hardware threads)
physical id 0: core ids 0-23,64-87
physical id 0: apicids 0-47,128-175
```

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
```

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## Platform Notes (Continued)

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Byte Order:                           | Little Endian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CPU(s):                               | 96                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| On-line CPU(s) list:                  | 0-95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Vendor ID:                            | GenuineIntel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| BIOS Vendor ID:                       | Intel(R) Corporation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Model name:                           | Intel(R) Xeon(R) 6740P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| BIOS Model name:                      | Intel(R) Xeon(R) 6740P CPU @ 2.1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| BIOS CPU family:                      | 179                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| CPU family:                           | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Model:                                | 173                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Thread(s) per core:                   | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Core(s) per socket:                   | 48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Socket(s):                            | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Stepping:                             | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| BogoMIPS:                             | 4200.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Flags:                                | fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat<br>pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx<br>pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good<br>nopl xtopology nonstop_tsc cpuid aperfmperf tsc_known_freq pni<br>pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16<br>xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt<br>tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm<br>3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 intel_ppin cdp_l2<br>ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept<br>vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid<br>rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt<br>clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec<br>xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local<br>split_lock_detect user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida<br>arat pln pts vnmi avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni<br>vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57<br>rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear<br>serialize tsxldtrk pconfig arch_lbr ibt amx_bf16 avx512_fp16 amx_tile<br>amx_int8 flush_l1d arch_capabilities |
| Virtualization:                       | VT-x                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| L1d cache:                            | 2.3 MiB (48 instances)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| L1i cache:                            | 3 MiB (48 instances)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| L2 cache:                             | 96 MiB (48 instances)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| L3 cache:                             | 288 MiB (1 instance)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| NUMA node(s):                         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| NUMA node0 CPU(s):                    | 0-23,48-71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| NUMA node1 CPU(s):                    | 24-47,72-95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Vulnerability Gather data sampling:   | Not affected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Vulnerability Itlb multihit:          | Not affected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Vulnerability L1tf:                   | Not affected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 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;<br>PBRSE-IBRS Not affected; BHI BHI_DIS_S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 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 |
|------|----------|----------|------|------|-------|------|----------|----------------|
|------|----------|----------|------|------|-------|------|----------|----------------|

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## Platform Notes (Continued)

|     |      |      |                |   |        |   |    |
|-----|------|------|----------------|---|--------|---|----|
| L1d | 48K  | 2.3M | 12 Data        | 1 | 64     | 1 | 64 |
| L1i | 64K  | 3M   | 16 Instruction | 1 | 64     | 1 | 64 |
| L2  | 2M   | 96M  | 16 Unified     | 2 | 2048   | 1 | 64 |
| L3  | 288M | 288M | 16 Unified     | 3 | 294912 | 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: 0-23,48-71
node 0 size: 128700 MB
node 0 free: 127996 MB
node 1 cpus: 24-47,72-95
node 1 size: 128989 MB
node 1 free: 128144 MB
node distances:
node  0  1
 0:  10  12
 1:  12  10
```

9. /proc/meminfo

MemTotal: 263874388 kB

10. who -r

run-level 3 Apr 22 17:30

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    apparmor auditd cron getty@ irqbalance issue-generator kbdsettings nvme-fc-boot-connections
           nvme-fc-autoconnect postfix purge-kernels rollback sshd systemd-pstore wicked wickedd-auto4
           wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime  systemd-remount-fs
disabled        boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell grub2-once
           haveged hwloc-dump-hwdata issue-add-ssh-keys kexec-load rpmconfigcheck serial-getty@
           systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-sysext
           systemd-time-wait-sync systemd-timesyncd
indirect     systemd-userdbd wickedd
```

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

```
BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=6815926d-0e31-407c-9bfc-7d4c1d8acd7f
splash=silent
resume=/dev/disk/by-uuid/3ddd6c4a-76f7-4f45-b79b-814fe2bce522
mitigations=auto
quiet
security=apparmor
```

14. cpupower frequency-info

```
analyzing CPU 8:
Unable to determine current policy
```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant Compute DL320 Gen12**

(2.10 GHz, Intel Xeon 6740P)

**SPECrate®2017\_int\_base = 495**

**SPECrate®2017\_int\_peak = 510**

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Mar-2025

**Hardware Availability:** Mar-2025

**Software Availability:** Jun-2024

## Platform Notes (Continued)

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: /home/cpu2017

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs 1.2T 245G 954G 21% /home
```

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

```
Vendor:      HPE
Product:     HPE ProLiant Compute DL320 Gen12
Product Family: ProLiant
Serial:      FLLKN48DYT
```

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## Platform Notes (Continued)

### 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 Micron MTC20F2085S1RC64BD2 QSFF 32 GB 2 rank 6400

### 22. BIOS

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

BIOS Vendor: HPE  
BIOS Version: 1.20  
BIOS Date: 02/14/2025  
BIOS Revision: 1.20  
Firmware Revision: 1.10

## Compiler Version Notes

C | 502.gcc\_r(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308  
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 505.mcf\_r(base, peak) 525.x264\_r(base, peak)  
| 557.xz\_r(base, peak)

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

C | 502.gcc\_r(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.1.0 Build 20240308  
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C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 505.mcf\_r(base, peak) 525.x264\_r(base, peak)  
| 557.xz\_r(base, peak)

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

C++ | 520.omnetpp\_r(base, peak) 523.xalancbmk\_r(base, peak) 531.deepsjeng\_r(base, peak)  
| 541.leela\_r(base, peak)

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**Tested by:** HPE

**Test Date:** Mar-2025

**Hardware Availability:** Mar-2025

**Software Availability:** Jun-2024

## Compiler Version Notes (Continued)

=====

Fortran | 548.exchange2\_r(base, peak)

-----

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

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-----

## Base Compiler Invocation

C benchmarks:  
icx

C++ benchmarks:  
icpx

Fortran benchmarks:  
ifx

## Base Portability Flags

500.perlbench\_r: -DSPEC\_LP64 -DSPEC\_LINUX\_X64

502.gcc\_r: -DSPEC\_LP64

505.mcf\_r: -DSPEC\_LP64

520.omnetpp\_r: -DSPEC\_LP64

523.xalancbmk\_r: -DSPEC\_LP64 -DSPEC\_LINUX

525.x264\_r: -DSPEC\_LP64

531.deepsjeng\_r: -DSPEC\_LP64

541.leela\_r: -DSPEC\_LP64

548.exchange2\_r: -DSPEC\_LP64

557.xz\_r: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math

-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4

-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

C++ benchmarks:

-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math

-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4

-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

(Continued on next page)



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## Base Optimization Flags (Continued)

Fortran benchmarks:

-w -m64 -wl, -z, muldefs -xsapphirerapids -O3 -ffast-math -flto  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs -align array32byte -auto  
-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmalloc

## Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

## Peak Portability Flags

500.perlbench\_r: -DSPEC\_LP64 -DSPEC\_LINUX\_X64  
502.gcc\_r: -D\_FILE\_OFFSET\_BITS=64  
505.mcf\_r: -DSPEC\_LP64  
520.omnetpp\_r: -DSPEC\_LP64  
523.xalancbmk\_r: -DSPEC\_LP64 -DSPEC\_LINUX  
525.x264\_r: -DSPEC\_LP64  
531.deepsjeng\_r: -DSPEC\_LP64  
541.leela\_r: -DSPEC\_LP64  
548.exchange2\_r: -DSPEC\_LP64  
557.xz\_r: -DSPEC\_LP64

## Peak Optimization Flags

C benchmarks:

500.perlbench\_r: -w -std=c11 -m64 -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

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CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Mar-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024

## Peak Optimization Flags (Continued)

500.perlbench\_r (continued):

-funroll-loops -qopt-mem-layout-trans=4  
-fno-strict-overflow  
-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmallo

502.gcc\_r: -m32 -L/opt/intel/oneapi/compiler/2024.1/lib32 -std=gnu89

-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  
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf\_r: basepeak = yes

525.x264\_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast

-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -fno-alias  
-L/opt/intel/oneapi/compiler/2024.1/lib -lqkmallo

557.xz\_r: basepeak = yes

C++ benchmarks:

520.omnetpp\_r: basepeak = yes

523.xalancbmk\_r: basepeak = yes

531.deepsjeng\_r: basepeak = yes

541.leela\_r: basepeak = yes

Fortran benchmarks:

548.exchange2\_r: basepeak = yes

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-GNR-rev1.1.html>

<http://www.spec.org/cpu2017/flags/Intel-ic2024-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-GNR-rev1.1.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml>



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Tested with SPEC CPU®2017 v1.1.9 on 2025-03-08 01:42:31-0500.

Report generated on 2025-04-09 14:57:42 by CPU2017 PDF formatter v6716.

Originally published on 2025-04-09.