## SPEC CPU®2017 Floating Point Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
**ProLiant DL380 Gen11**  
(2.70 GHz, Intel Xeon Max 9462)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
<th>Test Date:</th>
<th>May-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
<td>Hardware Availability:</td>
<td>Jun-2023</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
<td>Software Availability:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

### SPECrate®2017_fp_base = 866  
SPECrate®2017_fp_peak = 877

### Hardware

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>128</td>
<td>1020</td>
<td>1150</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>64</td>
<td>450</td>
<td>1150</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>128</td>
<td>715</td>
<td>737</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>64</td>
<td>487</td>
<td>549</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>128</td>
<td>715</td>
<td>737</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>128</td>
<td>918</td>
<td>918</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>128</td>
<td>666</td>
<td>666</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>128</td>
<td>770</td>
<td>1360</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>128</td>
<td>1920</td>
<td>1920</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>128</td>
<td>735</td>
<td>735</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>128</td>
<td>486</td>
<td>486</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>128</td>
<td>486</td>
<td>486</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>128</td>
<td>486</td>
<td>486</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>Red Hat Enterprise Linux release 9.0 (Plow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel</td>
<td>5.14.0-70.13.1.e9_0.x86_64</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 2023.0 of Intel oneAPI DPC++/C++</td>
</tr>
<tr>
<td></td>
<td>Compiler for Linux:</td>
</tr>
<tr>
<td></td>
<td>Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Firmware:</td>
<td>HPE BIOS Version v1.34 04/13/2023 released Apr-2023</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Power Management:</td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

### Hardware Details

- **CPU Name:** Intel Xeon Max 9462  
- **Max MHz:** 3500  
- **Nominal:** 2700  
- **Enabled:** 64 cores, 2 chips, 2 threads/core  
- **Orderable:** 1, 2 chip(s)  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 2 MB I+D on chip per core  
- **L3:** 75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 640 GB (16 x 32 GB 2Rx8 PC5-4800B-R + 2 x 64 GB HBM)  
- **Storage:** 1 x 480 GB SATA SSD  
- **Other:** None

### Software Details

- **OS:** Red Hat Enterprise Linux release 9.0 (Plow)  
- **Kernel:** 5.14.0-70.13.1.e9_0.x86_64  
- **Compiler:** C/C++: Version 2023.0 of Intel oneAPI DPC++/C++  
- **Compiler for Linux:**  
- **Fortran:** Version 2023.0 of Intel Fortran Compiler for Linux;  
- **Parallel:** No  
- **Firmware:** HPE BIOS Version v1.34 04/13/2023 released Apr-2023  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE
Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>128</td>
<td>313</td>
<td>4100</td>
<td>314</td>
<td>4090</td>
<td>313</td>
<td>4110</td>
<td>128</td>
<td>313</td>
<td>4100</td>
<td>314</td>
<td>4090</td>
<td>313</td>
<td>4110</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>128</td>
<td>160</td>
<td>1010</td>
<td>159</td>
<td>1020</td>
<td>64</td>
<td>70.7</td>
<td>1150</td>
<td>70.2</td>
<td>1150</td>
<td>70.8</td>
<td>1150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>508.namd_r</td>
<td>128</td>
<td>270</td>
<td>450</td>
<td>270</td>
<td>450</td>
<td>128</td>
<td>270</td>
<td>451</td>
<td>270</td>
<td>450</td>
<td>270</td>
<td>450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>510.parest_r</td>
<td>128</td>
<td>697</td>
<td>481</td>
<td>697</td>
<td>481</td>
<td>64</td>
<td>448</td>
<td>487</td>
<td>444</td>
<td>487</td>
<td>444</td>
<td>487</td>
<td></td>
<td></td>
</tr>
<tr>
<td>511 povray_r</td>
<td>128</td>
<td>418</td>
<td>715</td>
<td>418</td>
<td>715</td>
<td>128</td>
<td>406</td>
<td>737</td>
<td>404</td>
<td>741</td>
<td>406</td>
<td>736</td>
<td></td>
<td></td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>128</td>
<td>246</td>
<td>549</td>
<td>246</td>
<td>548</td>
<td>128</td>
<td>246</td>
<td>549</td>
<td>246</td>
<td>548</td>
<td>246</td>
<td>549</td>
<td></td>
<td></td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>128</td>
<td>312</td>
<td>918</td>
<td>313</td>
<td>916</td>
<td>128</td>
<td>312</td>
<td>918</td>
<td>313</td>
<td>916</td>
<td>312</td>
<td>918</td>
<td></td>
<td></td>
</tr>
<tr>
<td>526.blender_r</td>
<td>128</td>
<td>293</td>
<td>666</td>
<td>293</td>
<td>665</td>
<td>128</td>
<td>293</td>
<td>666</td>
<td>293</td>
<td>665</td>
<td>293</td>
<td>666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>128</td>
<td>297</td>
<td>754</td>
<td>291</td>
<td>770</td>
<td>288</td>
<td>778</td>
<td>291</td>
<td>770</td>
<td>288</td>
<td>778</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>128</td>
<td>166</td>
<td>1910</td>
<td>166</td>
<td>1920</td>
<td>166</td>
<td>1910</td>
<td>166</td>
<td>1920</td>
<td>166</td>
<td>1920</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>544.nab_r</td>
<td>128</td>
<td>158</td>
<td>1360</td>
<td>158</td>
<td>1360</td>
<td>128</td>
<td>158</td>
<td>1360</td>
<td>158</td>
<td>1360</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>128</td>
<td>678</td>
<td>736</td>
<td>685</td>
<td>729</td>
<td>679</td>
<td>735</td>
<td>678</td>
<td>736</td>
<td>685</td>
<td>729</td>
<td>679</td>
<td>735</td>
<td></td>
</tr>
<tr>
<td>554.roms_r</td>
<td>128</td>
<td>418</td>
<td>486</td>
<td>419</td>
<td>486</td>
<td>420</td>
<td>484</td>
<td>418</td>
<td>486</td>
<td>419</td>
<td>486</td>
<td>420</td>
<td>484</td>
<td></td>
</tr>
</tbody>
</table>

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

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>
tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"

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

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)

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

General Notes (Continued)

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

Platform Notes

The system ROM used for this result contains Intel microcode version 0x2b0004a1 for
the Intel Xeon Max 9462 processor.
BIOS Configuration:
Workload Profile set to General Throughput Compute
Memory Patrol Scrubbing set to Disabled
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Workload Profile set to Custom
Adjacent Sector Prefetch set to Disabled
DCU Stream Prefetcher set to Disabled
Intel UPI Link Power Management set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c3ae2c92cc097bec197
running on localhost.localdomain Fri May 26 22:16:39 2023

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

Table of contents

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 250 (250-6.e19_0)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/transparent
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 866</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 877</td>
</tr>
</tbody>
</table>

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

Platform Notes (Continued)

1. uname -a
   Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64 x86_64 GNU/Linux

2. w
   22:16:39 up  8:44,  1 user, load average: 0.00, 15.75, 64.20
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0     13:58    6:08m  1.32s  0.08s turbostat --quiet

3. Username
   From environment variable $USER: root

4. ulimit -a
   real-time non-blocking time (microseconds, -R) unlimited
   core file size (blocks, -c) 0
   data seg size (kbytes, -d) unlimited
   scheduling priority (-e) 0
   file size (blocks, -f) unlimited
   pending signals (-i) 2062775
   max locked memory (kbytes, -l) 64
   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) 2062775
   virtual memory (kbytes, -v) unlimited
   file locks (-x) unlimited

5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 18
   sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   sshd: root [priv]
   sshd: root@pts/0
   -bash
   -bash
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base:peak --drop_frate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base:peak --drop_frate --nopreenv --nopreenv --logfile
   $SPEC/tmp/CPU2017.006/templogs/preenv.frate.006.0.log --lognum 006.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/cpu2017
   $SPEC = /home/cpu2017

6. /proc/cpuinfo
   model name : Intel (R) Xeon (R) CPU Max 9462
   vendor_id : GenuineIntel
   cpu family : 6
   model : 143

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

CPU2017 License: 3
Test Date: May-2023
Test Sponsor: HPE
Hardware Availability: Jun-2023
Tested by: HPE
Software Availability: Dec-2022

Platform Notes (Continued)

stepping : 8
microcode : 0x2c0001d1
bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores : 32
siblings : 64
  2 physical ids (chips)
  128 processors (hardware threads)
physical id 0: core ids 0-31
physical id 1: core ids 0-31
physical id 0: apicids 0-63
physical id 1: apicids 128-191
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
virtualized systems. Use the above data carefully.

7. lscpu

From lscpu from util-linux 2.37.4:
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): 128
On-line CPU(s) list: 0-127
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel (R) Xeon (R) CPU Max 9462
BIOS Model name: Intel (R) Xeon (R) CPU Max 9462
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
Stepping: 8
BogoMIPS: 5400.00
Flags:
  fpu vme de pse ts cmov pae mce cx8 apr mpx msr lms cmov pat pse36
  clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdible
  lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
  nonstop_tsc cpuid aperf perfctr pfctr nkmmi pmcmnt qm cqm
  synctck syncref synchref
  mmca
  xsave
  tsc_deadline_timer aes xsave avx f16c rdrand
  lahf_lm abm 3dnowprefetch cpuid_fault epb cat _13 cat _12 cdp _13
  invpcid_single cdp _12 ssbd mbz ibrs ibpb stibp stibp_enhanced trp_shadow
  vmmi flexpriority extd_p t pbt fhfsb mba mce cx8 gvt vs rdtscp

Virtualization: VT-x
L1d cache: 3 MiB (64 instances)
L1i cache: 2 MiB (64 instances)
L2 cache: 128 MiB (64 instances)
L3 cache: 150 MiB (2 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-7,64-71
NUMA node1 CPU(s): 8-15,72-79

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

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

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

platform Notes (continued)

- NUMA node2 CPU(s): 16-23, 80-87
- NUMA node3 CPU(s): 24-31, 88-95
- NUMA node4 CPU(s): 32-39, 96-103
- NUMA node5 CPU(s): 40-47, 104-111
- NUMA node6 CPU(s): 48-55, 112-119
- NUMA node7 CPU(s): 56-63, 120-127
- Vulnerability Itlb multihit: Not affected
- Vulnerability L1tf: Not affected
- Vulnerability Mds: Not affected
- Vulnerability Meltdown: Not affected
- Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
- Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
- Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
- Vulnerability Srbds: Not affected
- Vulnerability Txr async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>3M</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>2M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>128M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>75M</td>
<td>150M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>81920</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

8. numactl --hardware

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

available: 8 nodes (0-7)

node 0 cpus: 0-7, 64-71
node 0 size: 64221 MB
node 0 free: 53047 MB
node 1 cpus: 8-15, 72-79
node 1 size: 64508 MB
node 1 free: 57908 MB
node 2 cpus: 16-23, 80-87
node 2 size: 64508 MB
node 2 free: 57829 MB
node 3 cpus: 24-31, 88-95
node 3 size: 64508 MB
node 3 free: 57828 MB
node 4 cpus: 32-39, 96-103
node 4 size: 64508 MB
node 4 free: 57920 MB
node 5 cpus: 40-47, 104-111
node 5 size: 64508 MB
node 5 free: 57918 MB
node 6 cpus: 48-55, 112-119
node 6 size: 64508 MB
node 6 free: 57915 MB
node 7 cpus: 56-63, 120-127
node 7 size: 64461 MB
node 7 free: 57820 MB

donode distances:

<table>
<thead>
<tr>
<th>node</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>10</td>
<td>17</td>
<td>17</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>17</td>
<td>10</td>
<td>17</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>10</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>10</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>17</td>
<td>10</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>17</td>
<td>17</td>
<td>10</td>
<td>17</td>
</tr>
</tbody>
</table>

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise

(2.70 GHz, Intel Xeon Max 9462)

Copyright 2017-2023 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

CPU2017 License: 3
Test Sponsor: HPE
Test Date: May-2023
Tested by: HPE
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Platform Notes (Continued)

7:  26  26  26  26  17  17  17  10

9. /proc/meminfo
   MemTotal:  528111120 kB

10. who -r
    run-level 3 May 26 13:32

11. Systemd service manager version: systemd 250 (250-6.e19_0)
    Default Target  Status
    multi-user  degraded

12. Failed units, from systemctl list-units --state=failed
    UNIT         LOAD   ACTIVE SUB    DESCRIPTION
    * sep5.service loaded failed failed systemd script to load sep5 driver at boot time

13. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sep5 sshd sssd
systemd-network-generator tuned udisks2 upower
    enabled-runtime  systemd-remount-fs
    disabled        blk-availability canberra-system-bootstrap canberra-system-shutdown
    canberra-system-shutdown-reboot chrony-wait chronyd console-getty cpupower debug-shell
    hwloc-dump-hwdata ipsec kvm_stat man-db-restart-cache-update nftables powertop rdisc rhsm
    rham-facts rpmdb-rebuild serial-getty@ sshd-keygen@ systemd-boot-check-no-failures
    systemd-pstore systemd-sysex
    indirect        sssd-autofs sssd-kcm sssd-nsq sssd-pac sssd-pam sssd-ssh sssd-sudo

14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
    root=/dev/mapper/rhel-root
    ro
    resume=/dev/mapper/rhel-swap
    rd.lvm.lv=rhel/root
    rd.lvm.lv=rhel/swap

15. cpupower frequency-info
    analyzing CPU 0:
    Unable to determine current policy
    boost state support:
    Supported: yes
    Active: yes

16. tuned-adm active
    Current active profile: throughput-performance

17. sysctl
    kernel.numa_balancing  1
    kernel.randomize_va_space  2

(Continued on next page)
SPEC CPU® 2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

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

Platform Notes (Continued)

vm.compaction_proactiveness        20
vm.dirty_background_bytes           0
vm.dirty_background_ratio          10
vm.dirty_bytes                      0
vm.dirty_expire_centisecs        3000
vm.dirty_ratio                     40
vm.dirty_writeback_centisecs      500
vm.dirtytime_expire_seconds     43200
vm.extfrag_threshold              500
vm.min_unmapped_ratio               3
vm.nr_hugepages                    0
vm.nr_hugepages_mempolicy          0
vm.nr_overcommit_hugepages         0
vm.swappiness                      10
vm.watermark_boost_factor         15000
vm.watermark_scale_factor          10
vm.zone_reclaim_mode               0

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

19. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs       60000
   defrag                        1
   max_ptes_none                  511
   max_ptes_shared               256
   max_ptes_swap                  64
   pages_to_scan                 4096
   scan_sleep_millisecs         10000

20. OS release
   From /etc/*-release /etc/*-version
   os-release    Red Hat Enterprise Linux 9.0 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
   system-release Red Hat Enterprise Linux release 9.0 (Plow)

21. Disk information
   SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   372G   90G  283G  24% /home

22. /sys/devices/virtual/dmi/id
   Vendor:         HPE
   Product:        ProLiant DL380 Gen11
   Product Family: ProLiant
   Serial:         CNX21000G8

23. dmidecode
   Additional information from dmidecode 3.3 follows. WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

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

Platform Notes (Continued)

"DMTF SMBIOS" standard.
Memory:
1x Hynix HMCG88AEBRA168N 32 GB 2 rank 4800
15x Hynix HMCG88MEBRA113N 32 GB 2 rank 4800

24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: HPE
BIOS Version: 1.34
BIOS Date: 04/13/2023
BIOS Revision: 1.34
Firmware Revision: 1.10

Compiler Version Notes

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPECrater®2017_fp_base = 866
SPECrater®2017_fp_peak = 877

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

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

Compiler Version Notes (Continued)

Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 866</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 877</td>
</tr>
</tbody>
</table>

CPU2017 License: 3  Test Date: May-2023  Hardware Availability: Jun-2023  Test Sponsor: HPE  Tested by: HPE  Software Availability: Dec-2022

Base Optimization Flags

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

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

Fortran benchmarks:
- w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto
- mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- nostandard-realloc-lhs -align array32byte -auto -ljemalloc
- L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
- w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
- flto -mpfmath=sse -funroll-loops -qopt-mem-layout-trans=4
- Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs
- align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
- w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
- ffast-math -flto -mpfmath=sse -funroll-loops
- qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
- ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

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

Peak Compiler Invocation

C benchmarks:
  icx

C++ benchmarks:
  icpx

(Continued on next page)
### Peak Compiler Invocation (Continued)

Fortran benchmarks:
- ifx

Benchmarks using both Fortran and C:
- ifx icx

Benchmarks using both C and C++:
- icpx icx

Benchmarks using Fortran, C, and C++:
- icpx icx ifx

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**

- 519.lbm_r: basepeak = yes
- 538.imagick_r: basepeak = yes
- 544.nab_r: basepeak = yes

**C++ benchmarks:**

- 508.namd_r: basepeak = yes

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

**Fortran benchmarks:**

- 503.bwaves_r: basepeak = yes

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen11
(2.70 GHz, Intel Xeon Max 9462)

SPECrate®2017_fp_base = 866
SPECrate®2017_fp_peak = 877

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date: May-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: Jun-2023</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Dec-2022</td>
</tr>
</tbody>
</table>

Peak Optimization Flags (Continued)

549.fotonik3d_r: basepeak = yes
554.roms_r: basepeak = yes

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes
527.cam4_r: basepeak = yes

Benchmarks using both C and C++:


526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:


The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev2.1.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev2.1.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html

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

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.9 on 2023-05-26 12:46:39-0400.
Originally published on 2023-06-20.