# SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10 Plus  
(2.80 GHz, Intel Xeon Silver 4309Y)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>134</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>138</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Jun-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Dec-2020

## Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>89.4</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>111</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>135</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>89.2</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>169</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>231</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>102</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>98.9</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>273</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>71.5</td>
</tr>
</tbody>
</table>

**CPU Name:** Intel Xeon Silver 4309Y  
**Max MHz:** 3600  
**Nominal:** 2800  
**Enabled:** 16 cores, 2 chips, 2 threads/core  
**Orderable:** 1, 2 chip(s)  
**Cache L1:** 32 KB I + 48 KB D on chip per core  
**L2:** 1.25 MB I+D on chip per core  
**L3:** 12 MB I+D on chip per chip  
**Other:** None  
**Memory:** 2 TB (32 x 64 GB 2Rx4 PC4-3200AA-R, running at 2666)  
**Storage:** 1 x 800 GB SAS SSD, RAID 0  
**Other:** None

## Software

**OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
**Kernel:** 4.18.0-240.el8.x86_64  
**Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux  
**Parallel:** No  
**Firmware:** HPE BIOS Version U46 v1.42 05/26/2021 released May-2021  
**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
## 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>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>570</td>
<td>89.4</td>
<td>570</td>
<td>89.5</td>
<td>570</td>
<td>89.4</td>
<td>32</td>
<td>489</td>
<td>104</td>
<td>489</td>
<td>104</td>
<td>488</td>
<td>104</td>
<td>488</td>
<td>104</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>410</td>
<td>111</td>
<td>408</td>
<td>111</td>
<td>408</td>
<td>111</td>
<td>32</td>
<td>362</td>
<td>125</td>
<td>362</td>
<td>125</td>
<td>362</td>
<td>125</td>
<td>362</td>
<td>125</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>224</td>
<td>231</td>
<td>225</td>
<td>230</td>
<td><strong>224</strong></td>
<td><strong>231</strong></td>
<td>32</td>
<td>224</td>
<td>231</td>
<td>225</td>
<td>230</td>
<td><strong>224</strong></td>
<td><strong>231</strong></td>
<td>32</td>
<td>224</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>470</td>
<td>89.3</td>
<td>472</td>
<td>88.9</td>
<td>471</td>
<td>89.2</td>
<td>32</td>
<td>470</td>
<td>89.3</td>
<td>472</td>
<td>88.9</td>
<td>471</td>
<td>89.2</td>
<td>32</td>
<td>470</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>200</td>
<td>169</td>
<td><strong>200</strong></td>
<td><strong>169</strong></td>
<td>199</td>
<td>170</td>
<td>32</td>
<td>200</td>
<td>169</td>
<td><strong>200</strong></td>
<td><strong>169</strong></td>
<td>199</td>
<td>170</td>
<td>32</td>
<td>200</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>205</td>
<td><strong>273</strong></td>
<td>205</td>
<td>274</td>
<td>205</td>
<td>273</td>
<td>32</td>
<td>196</td>
<td><strong>286</strong></td>
<td>196</td>
<td>286</td>
<td>196</td>
<td>286</td>
<td>32</td>
<td>196</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>359</td>
<td>102</td>
<td><strong>359</strong></td>
<td><strong>102</strong></td>
<td>360</td>
<td>102</td>
<td>32</td>
<td>359</td>
<td>102</td>
<td><strong>359</strong></td>
<td><strong>102</strong></td>
<td>360</td>
<td>102</td>
<td>32</td>
<td>359</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>536</td>
<td><strong>98.9</strong></td>
<td>536</td>
<td>98.9</td>
<td>536</td>
<td>98.9</td>
<td>32</td>
<td>536</td>
<td><strong>98.9</strong></td>
<td>536</td>
<td>98.9</td>
<td>536</td>
<td>98.9</td>
<td>32</td>
<td>536</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>303</td>
<td>276</td>
<td>304</td>
<td>276</td>
<td><strong>304</strong></td>
<td><strong>276</strong></td>
<td>32</td>
<td>303</td>
<td>276</td>
<td>304</td>
<td>276</td>
<td><strong>304</strong></td>
<td><strong>276</strong></td>
<td>32</td>
<td>303</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>483</td>
<td>71.5</td>
<td>482</td>
<td>71.7</td>
<td><strong>483</strong></td>
<td><strong>71.5</strong></td>
<td>32</td>
<td>483</td>
<td>71.5</td>
<td>482</td>
<td>71.7</td>
<td><strong>483</strong></td>
<td><strong>71.5</strong></td>
<td>32</td>
<td>483</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 134**

**SPECrate®2017_int_peak = 138**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```
sync; echo 3 > /proc/sys/vm/drop_caches
```

### 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"
MALLOCONF = "retain:true"
```

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1

runcpu command invoked through numactl i.e.:
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

SPECrate®2017_int_base = 134
SPECrate®2017_int_peak = 138

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

General Notes (Continued)

numactl --interleave=all runcpu <etc>
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.

Submitted by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>
Submitted: Mon Jul 5 08:13:22 EDT 2021
Submission: cpu2017-20210705-27779.sub

Platform Notes

The system ROM used for this result contains Intel microcode version 0xd0002a0 for the Intel Xeon Silver 4309Y processor.

BIOS Configuration:
Workload Profile set to General Throughput Compute
Memory Patrol Scrubbing set to Disabled
Advanced Memory Protection set to Advanced ECC
XPT Remote Prefetcher set to Enabled
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Intel UPI Link Frequency set to Minimum
Intel UPI Link Enablement set to Single Link
D2K set to Disabled
Workload Profile set to Custom
DCU Stream Prefetcher set to Disabled
Energy Efficient Turbo set to Enabled
Adjacent Sector Prefetcher set to Disabled
Intel UPI Link Power Management set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaafc64d
running on localhost.localdomain Wed Jun 23 09:55:28 2021

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

(Continued on next page)
Platform Notes (Continued)

model name : Intel(R) Xeon(R) Silver 4309Y CPU @ 2.80GHz
  2 "physical id"s (chips)
  32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 8
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7

From 1scpu from util-linux 2.32.1:
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
CPU(s):              32
On-line CPU(s) list: 0-31
Thread(s) per core:  2
Core(s) per socket:  8
NUMA node(s):        2
Vendor ID:           GenuineIntel
CPU family:          6
Model:               106
Model name:          Intel(R) Xeon(R) Silver 4309Y CPU @ 2.80GHz
Stepping:            6
CPU MHz:             1834.519
BogoMIPS:            5600.00
Virtualization:      VT-x
L1d cache:           48K
L1i cache:           32K
L2 cache:            1280K
L3 cache:            12288K
NUMA node0 CPU(s):   0-7,16-23
NUMA node1 CPU(s):   8-15,24-31
Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd
mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
fs_base tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdkey srqm mcm nnr mcm
mcm_b31 mcm_b32 mcm_b33 mcm_b34 mcm_b35 mcm_b36 mcm_b37 mcm_b38 mcm_b39
mcm_b40 mcm_b41 mcm_b42 mcm_b43 mcm_b44 mcm_b45 mcm_b46 mcm_b47 mcm_b48
mcm_b49 mcm_b50 mcm_b51 mcm_b52 mcm_b53 mcm_b54 mcm_b55 mcm_b56 mcm_b57
mcm_b58 mcm_b59 mcm_b60 mcm_b61 mcm_b62 mcm_b63 mcm_b64 mcm_b65 mcm_b66
mcm_b67 mcm_b68 mcm_b69 mcm_b70 mcm_b71 mcm_b72 mcm_b73 mcm_b74 mcm_b75
mcm_b76 mcm_b77 mcm_b78 mcm_b79 mcm_b80 mcm_b81 mcm_b82 mcm_b83 mcm_b84
mcm_b85 mcm_b86 mcm_b87 mcm_b88 mcm_b89 mcm_b90 mcm_b91 mcm_b92 mcm_b93
mcm_b94 mcm_b95 mcm_b96 mcm_b97 mcm_b98 mcm_b99 mcm_b100 mcm_b101 mcm_b102
mcm_b103 mcm_b104 mcm_b105 mcm_b106 mcm_b107 mcm_b108 mcm_b109 mcm_b110
mcm_b111 mcm_b112 mcm_b113 mcm_b114 mcm_b115 mcm_b116 mcm_b117 mcm_b118
mcm_b119 mcm_b120 mcm_b121 mcm_b122 mcm_b123 mcm_b124 mcm_b125 mcm_b126
mcm_b127 mcm_b128 mcm_b129 mcm_b130 mcm_b131 mcm_b132 mcm_b133 mcm_b134
mcm_b135 mcm_b136 mcm_b137 mcm_b138 mcm_b139 mcm_b140 mcm_b141 mcm_b142
mcm_b143 mcm_b144 mcm_b145 mcm_b146 mcm_b147 mcm_b148 mcm_b149 mcm_b150
mcm_b151 mcm_b152 mcm_b153 mcm_b154 mcm_b155 mcm_b156 mcm_b157 mcm_b158
mcm_b159 mcm_b160 mcm_b161 mcm_b162 mcm_b163 mcm_b164 mcm_b165 mcm_b166
mcm_b167 mcm_b168 mcm_b169 mcm_b170 mcm_b171 mcm_b172 mcm_b173 mcm_b174
mcm_b175 mcm_b176 mcm_b177 mcm_b178 mcm_b179 mcm_b180 mcm_b181 mcm_b182
mcm_b183 mcm_b184 mcm_b185 mcm_b186 mcm_b187 mcm_b188 mcm_b189 mcm_b190
mcm_b191 mcm_b192 mcm_b193 mcm_b194 mcm_b195 mcm_b196 mcm_b197 mcm_b198
mcm_b199 mcm_b200 mcm_b201 mcm_b202 mcm_b203 mcm_b204 mcm_b205 mcm_b206
mcm_b207 mcm_b208 mcm_b209 mcm_b210 mcm_b211 mcm_b212 mcm_b213 mcm_b214
mcm_b215 mcm_b216 mcm_b217 mcm_b218 mcm_b219 mcm_b220 mcm_b221 mcm_b222
mcm_b223 mcm_b224 mcm_b225 mcm_b226 mcm_b227 mcm_b228 mcm_b229 mcm_b230
mcm_b231 mcm_b232 mcm_b233 mcm_b234 mcm_b235 mcm_b236 mcm_b237 mcm_b238
mcm_b239 mcm_b240 mcm_b241 mcm_b242 mcm_b243 mcm_b244 mcm_b245 mcm_b246
mcm_b247 mcm_b248 mcm_b249 mcm_b250 mcm_b251 mcm_b252 mcm_b253 mcm_b254
mcm_b255

(Continued on next page)
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

SPECrate®2017_int_base = 134
SPECrate®2017_int_peak = 138

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

SPEC CPU®2017 Integer Rate Result

Platform Notes (Continued)

/proc/cpuinfo cache data
  cache size : 12288 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
  node 0 size: 1008457 MB
  node 0 free: 1031279 MB
  node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
  node 1 size: 1007435 MB
  node 1 free: 1031469 MB
  node distances:
    node 0 1
    0: 10 20
    1: 20 10

From /proc/meminfo
  MemTotal: 2113495820 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/sbin/tuned-adm active
  Current active profile: throughput-performance

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.3 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.3"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
    ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
  Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
  CVE-2018-12207 (iTLB Multihit): Not affected

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10 Plus  
(2.80 GHz, Intel Xeon Silver 4309Y)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 134</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak = 138</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Jun-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Dec-2020

## Platform Notes (Continued)

<table>
<thead>
<tr>
<th>CVE-2018-3620 (L1 Terminal Fault):</th>
<th>Not affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microarchitectural Data Sampling:</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2017-5754 (Meltdown):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3639 (Speculative Store Bypass):</td>
<td>Mitigation: Speculative Store Bypass disabled via prctl and seccomp</td>
</tr>
<tr>
<td>CVE-2017-5753 (Spectre variant 1):</td>
<td>Mitigation: usercopy/swaps barriers and __user pointer sanitation</td>
</tr>
<tr>
<td>CVE-2017-5715 (Spectre variant 2):</td>
<td>Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling</td>
</tr>
<tr>
<td>CVE-2020-0543 (Special Register Buffer Data Sampling):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2019-11135 (TSX Asynchronous Abort):</td>
<td>Not affected</td>
</tr>
</tbody>
</table>

run-level 3 Jun 23 09:54

**SPEC is set to:** /home/cpu2017

**Filesystem**

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>xfs</td>
<td>670G</td>
<td>120G</td>
<td>550G</td>
<td>18%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

<table>
<thead>
<tr>
<th>Vendor:</th>
<th>HPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product:</td>
<td>ProLiant DL360 Gen10 Plus</td>
</tr>
<tr>
<td>Product Family:</td>
<td>ProLiant</td>
</tr>
<tr>
<td>Serial:</td>
<td>CN701108CK</td>
</tr>
</tbody>
</table>

Additional information from dmidecode 3.2 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:

32x Micron 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200, configured at 2666

**BIOS:**

<table>
<thead>
<tr>
<th>BIOS Vendor:</th>
<th>HPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Version:</td>
<td>U46</td>
</tr>
<tr>
<td>BIOS Date:</td>
<td>05/26/2021</td>
</tr>
<tr>
<td>BIOS Revision:</td>
<td>1.42</td>
</tr>
<tr>
<td>Firmware Revision:</td>
<td>2.50</td>
</tr>
</tbody>
</table>

(End of data from sysinfo program)

## Compiler Version Notes

| C          | 500.perlbench_r(peak) |

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

SPECrate®2017_int_base = 134
SPECrate®2017_int_peak = 138

Copyright 2017-2021 Standard Performance Evaluation Corporation

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

Test Date: Jun-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

_________________________________________________________________________________
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---------------------------------------------------------------------------------------------
C | 502.gcc_r(peak)

---------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---------------------------------------------------------------------------------------------
C | 500.perlbench_r(base) 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 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---------------------------------------------------------------------------------------------
C | 500.perlbench_r(peak)

---------------------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---------------------------------------------------------------------------------------------
C | 502.gcc_r(peak)

---------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version
2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---------------------------------------------------------------------------------------------
C | 500.perlbench_r(base) 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 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10 Plus  
(2.80 GHz, Intel Xeon Silver 4309Y)  

SPEC CPU®2017 Integer Rate Result  
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 134  
SPECrate®2017_int_peak = 138

Compiler Version Notes (Continued)

C       | 500.perlbench_r(peak)
---------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
---------------------------------------------------------------

C       | 502.gcc_r(peak)
---------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
---------------------------------------------------------------

C       | 500.perlbench_r(base) 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 2021.1 Build 20201113  
Copyright (C) 1985-2020 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)
---------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
---------------------------------------------------------------

Fortran | 548.exchange2_r(base, peak)
---------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
---------------------------------------------------------------
SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

SPECrater®2017_int_base = 134
SPECrater®2017_int_peak = 138

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

Test Date: Jun-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

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 -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>134</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>138</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Jun-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Jun-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

**Base Optimization Flags (Continued)**

Fortran benchmarks (continued):
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**Peak Compiler Invocation**

C benchmarks (except as noted below):
- `icc`
- `500.perlbench_r:icc`

C++ benchmarks:
- `icpx`

Fortran benchmarks:
- `ifort`

**Peak Portability Flags**

- `500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64`
- `502.gcc_r: -D_FILE_OFFSET_BITS=64`
- `505.mc_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: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)`
- `xCORE-AVX512 -ipo -03 -no-prec-div`
- `qopt-mem-layout-trans=4 -fno-strict-overflow`
- `mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date:</th>
<th>Jun-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability:</td>
<td>Jun-2021</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

**SPEC CPU®2017 Integer Rate Result**

**SPECrate®2017_int_base = 134**

**SPECrate®2017_int_peak = 138**

Peak Optimization Flags (Continued)

502.gcc_r: -m32
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

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-V1.0-ICX-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.0-ICX-revE.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEC CPU®2017 Integer Rate Result</td>
<td></td>
</tr>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jun-2021</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
<tr>
<td>SPECrate®2017_int_base</td>
<td>134</td>
</tr>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>138</td>
</tr>
</tbody>
</table>

Hewlett Packard Enterprise
ProLiant DL360 Gen10 Plus (2.80 GHz, Intel Xeon Silver 4309Y)

Copyright 2017-2021 Standard Performance Evaluation Corporation

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