Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(3.00 GHz, Intel Xeon Gold 6248R)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 260</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 280</td>
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<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Gold 6248R</td>
<td></td>
</tr>
<tr>
<td>Max MHz: 4000</td>
<td></td>
</tr>
<tr>
<td>Nominal: 3000</td>
<td></td>
</tr>
<tr>
<td>Enabled: 48 cores, 2 chips, 2 threads/core</td>
<td></td>
</tr>
<tr>
<td>Orderable: 1, 2 chip(s)</td>
<td></td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td></td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td></td>
</tr>
<tr>
<td>L3: 35.75 MB I+D on chip per chip</td>
<td></td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)</td>
<td></td>
</tr>
<tr>
<td>Storage: 1 x 400 GB SAS SSD</td>
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<tr>
<td>Other: None</td>
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<table>
<thead>
<tr>
<th>Test Sponsor: HPE</th>
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<tbody>
<tr>
<td>Hardware Availability: Feb-2020</td>
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<tr>
<td>Software Availability: Jun-2019</td>
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<td>Test Date: Feb-2020</td>
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<td>Software Availability: Jun-2019</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<td>508.namd_r</td>
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<td>511.povray_r</td>
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<td>519.lbm_r</td>
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<td>521.wrf_r</td>
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<td>526.blender_r</td>
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<td>527.cam4_r</td>
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<tr>
<td>538.imagick_r</td>
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<tr>
<td>544.nab_r</td>
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<tr>
<td>549.fotonik3d_r</td>
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<tr>
<td>554.roms_r</td>
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<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: SUSE Linux Enterprise Server 15 SP1 (x86_64)</td>
<td></td>
</tr>
<tr>
<td>Kernel 4.12.14-195-default</td>
<td></td>
</tr>
<tr>
<td>Compiler: C/C++: Version 19.0.4.227 of Intel C/C++</td>
<td></td>
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<tr>
<td>Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran</td>
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<tr>
<td>Compiler Build 20190416 for Linux</td>
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<tr>
<td>Parallel: No</td>
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</tr>
<tr>
<td>Firmware: HPE BIOS Version U30 2.22 (11/13/2019) released Feb-2020</td>
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<tr>
<td>File System: btrfs</td>
<td></td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td></td>
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<tr>
<td>Base Pointers: 64-bit</td>
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</tr>
<tr>
<td>Peak Pointers: 64-bit</td>
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<tr>
<td>Other: None</td>
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</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage</td>
<td></td>
</tr>
</tbody>
</table>
# SPEC CPU®2017 Floating Point Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(3.00 GHz, Intel Xeon Gold 6248R)

**SPECrate®2017_fp_base** = 260  
**SPECrate®2017_fp_peak** = 280

## Results Table

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</tbody>
</table>

**SPECrate®2017_fp_base** = 260  
**SPECrate®2017_fp_peak** = 280

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

## Submit Notes

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

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"  
Transparent Huge Pages enabled by default  
Prior to runcpu invocation  
Filesystem page cache synced and cleared with:  
  sync; echo 3 > /proc/sys/vm/drop_caches  
runcpu command invoked through numactl i.e.:  
  numactl --interleave=all runcpu <etc>

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(3.00 GHz, Intel Xeon Gold 6248R)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 260
SPECrate®2017_fp_peak = 280

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

General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5

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.

Platform Notes

BIOS Configuration:
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Workload Profile set to General Throughput Compute
Workload Profile set to Custom
Minimum Processor Idle Power Core C-State set to C1E State

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1b1e6e46a485a0011
running on linux-r6ge Tue Feb 4 19:06:50 2020

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
model name : Intel(R) Xeon(R) Gold 6248R CPU @ 3.00GHz
  2 "physical id"s (chips)
  96 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 1: cores 0 1 2 3 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit

(Continued on next page)
Platform Notes (Continued)

Byte Order:           Little Endian
Address sizes:        46 bits physical, 48 bits virtual
CPU(s):              96
On-line CPU(s) list:  0-95
Thread(s) per core:   2
Core(s) per socket:   24
Socket(s):            2
NUMA node(s):         4
Vendor ID:            GenuineIntel
CPU family:           6
Model:                85
Model name:           Intel(R) Xeon(R) Gold 6248R CPU @ 3.00GHz
Stepping:             7
CPU MHz:              3000.000
BogoMIPS:             6000.00
Virtualization:       VT-x
L1d cache:            32K
L1i cache:            32K
L2 cache:             1024K
L3 cache:             36608K
NUMA node0 CPU(s):    0-11,48-59
NUMA node1 CPU(s):    12-23,60-71
NUMA node2 CPU(s):    24-35,72-83
NUMA node3 CPU(s):    36-47,84-95
Flags:                fpu vme de pse tsc msr pae mca cmov
                       pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpext rdtsscp
                       lm constant_tsc art_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
                       aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
                       xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt pmlsar zmm空间 cpuid_fault
                       cpuid_extended_table make_rdtscp adx xsave f16c rdrand lahf_lm abalanced_mm
                       3nowprefetch cpuid_fault epb cat_l3 cdp_l3
                       invpcid_single intel_pcin ssbd mba ibrs ibpb stibp ibrs enhanced tpr_shadow
                       vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi hle avx2 smep bmi2 ibrms invpcid
                       rtm cmx mxpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt
                       avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaveopt xsaveopt
                       xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt
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                       xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
node 0 size: 96357 MB
node 0 free: 95956 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
node 1 size: 96357 MB
node 1 free: 95956 MB
node 2 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56
node 2 size: 96357 MB
node 2 free: 95956 MB
node 3 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 3 size: 96357 MB
node 3 free: 95956 MB
/node/proc/cpuinfo cache data
   cache size: 36608 KB

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

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(3.00 GHz, Intel Xeon Gold 6248R)

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<td>HPE</td>
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<td>Feb-2020</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jun-2019</td>
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### Platform Notes (Continued)

| node 1 size: 96733 MB |
| node 1 free: 94512 MB |
| node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 72 73 74 75 76 77 78 79 80 81 82 83 |
| node 2 size: 96763 MB |
| node 2 free: 96496 MB |
| node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 84 85 86 87 88 89 90 91 92 93 94 95 |
| node 3 size: 96761 MB |
| node 3 free: 96515 MB |

**node distances:**
- node 0: 10 21 31 31
- node 1: 21 10 31 31
- node 2: 31 31 10 21
- node 3: 31 31 21 10

From `/proc/meminfo`

- MemTotal: 395895816 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/etc/*release* /etc/*version*`

- NAME="SLES"
- VERSION="15-SP1"
- VERSION_ID="15.1"
- PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
- ID="sles"
- ID_LIKE="suse"
- ANSI_COLOR="0;32"
- CPE_NAME="cpe:/o:suse:sles:15:sp1"

uname -a:

```
Linux linux-r6ge 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
x86_64 x86_64 x86_64 GNU/Linux
```

**Kernel self-reported vulnerability status:**

- CVE-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: Not affected
- CVE-2017-5754 (Meltdown): Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Feb 4 19:04

(Continued on next page)
### Platform Notes (Continued)

SPEC is set to: `/home/cpu2017`

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<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
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<th>Use%</th>
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<tr>
<td><code>/dev/sda2</code></td>
<td>btrfs</td>
<td>371G</td>
<td>105G</td>
<td>266G</td>
<td>29%</td>
<td><code>/home</code></td>
</tr>
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</table>

From `/sys/devices/virtual/dmi/id`
- BIOS: HPE U30 11/13/2019
- Vendor: HPE
- Product: ProLiant DL380 Gen10
- Product Family: ProLiant
- Serial: 2M294204YX

Additional information from dmidecode 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: 24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933

(End of data from sysinfo program)

### Compiler Version Notes

<table>
<thead>
<tr>
<th>C</th>
<th>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416 Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
<td></td>
</tr>
<tr>
<td>C++</td>
<td>508.namd_r(base, peak) 510.parest_r(base, peak)</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>C++, C</td>
<td>511.povray_r(base, peak) 526.blender_r(base, peak)</td>
</tr>
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</tbody>
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(Continued on next page)
Compiler Version Notes (Continued)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
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---

C++, C, Fortran | 507.cactuBSSN_r(base, peak)

---

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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
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---

Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
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---

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

---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
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---

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
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---

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(3.00 GHz, Intel Xeon Gold 6248R)

SPECrate®2017_fp_base = 260
SPECrate®2017_fp_peak = 280

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

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(3.00 GHz, Intel Xeon Gold 6248R)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 260
SPECrate®2017_fp_peak = 280

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

Test Date: Feb-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags
Peak Optimization Flags

C benchmarks:

519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

544.nab_r: Same as 538.imagick_r

C++ benchmarks:

508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:

-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4
**SPEC CPU®2017 Floating Point Rate Result**

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
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<table>
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</table>

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

**Peak Optimization Flags (Continued)**

```plaintext
526.blender_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4
```

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.html

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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.xml

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

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