## SPEC® CPU2017 Floating Point Rate Result

### Hewlett Packard Enterprise

**Test Sponsor:** HPE  
**ProLiant DL380 Gen10**  
**(1.90 GHz, Intel Xeon Gold 6262V)**

### SPECrate2017_fp_base = 212

### SPECrate2017_fp_peak = Not Run

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Jun-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 6262V</td>
</tr>
<tr>
<td>Max MHz.</td>
<td>3600</td>
</tr>
<tr>
<td>Nominal</td>
<td>1900</td>
</tr>
<tr>
<td>Enabled</td>
<td>48 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1, 2 chip(s)</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>33 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2400)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 960 GB SATA SSD, RAID 0</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS:</td>
<td>SUSE Linux Enterprise Server 15 (x86_64)</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 19.0.1.144 of Intel C/C++</td>
</tr>
<tr>
<td>Fortran:</td>
<td>Compiler Build 20181018 for Linux; Fortran: Version 19.0.1.144 of Intel Fortran</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Firmware:</td>
<td>HPE BIOS Version U30 04/18/2019 released Apr-2019</td>
</tr>
<tr>
<td>File System:</td>
<td>btrfs</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>Not Applicable</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
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</table>

---

![Graph](image.png)
**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak Copies</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>96</td>
<td>2186</td>
<td>440</td>
<td>2192</td>
<td>439</td>
<td>2187</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>96</td>
<td>611</td>
<td>199</td>
<td>612</td>
<td>198</td>
<td>613</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>96</td>
<td>522</td>
<td>175</td>
<td>527</td>
<td>173</td>
<td>524</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>96</td>
<td>2359</td>
<td>106</td>
<td>2346</td>
<td>107</td>
<td>2364</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>96</td>
<td>829</td>
<td>271</td>
<td>832</td>
<td>269</td>
<td>830</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>96</td>
<td>940</td>
<td>108</td>
<td>941</td>
<td>108</td>
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<tr>
<td>521.wrf_r</td>
<td>96</td>
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<td>194</td>
<td>1106</td>
<td>194</td>
<td>1106</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>96</td>
<td>563</td>
<td>260</td>
<td>564</td>
<td>259</td>
<td>564</td>
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<tr>
<td>527.cam4_r</td>
<td>96</td>
<td>617</td>
<td>272</td>
<td>616</td>
<td>272</td>
<td>621</td>
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<tr>
<td>538.imagick_r</td>
<td>96</td>
<td>419</td>
<td>570</td>
<td>417</td>
<td>572</td>
<td>416</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>96</td>
<td>413</td>
<td>391</td>
<td>412</td>
<td>392</td>
<td>413</td>
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<tr>
<td>549.fotonik3d_r</td>
<td>96</td>
<td>2589</td>
<td>144</td>
<td>2610</td>
<td>143</td>
<td>2597</td>
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<tr>
<td>554.roms_r</td>
<td>96</td>
<td>1856</td>
<td>82.2</td>
<td>1855</td>
<td>82.2</td>
<td>1871</td>
</tr>
</tbody>
</table>

**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>

**General Notes**

- Environment variables set by runcpu before the start of the run:
  - LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"

- 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.
SPEC CPU2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

SPECrate2017_fp_base = 212
SPECrate2017_fp_peak = Not Run

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

Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

General Notes (Continued)

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
Energy/Performance Bias set to Balanced Performance
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-ta8j Sat Jun 22 07:09:46 2019

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 6262V CPU @ 1.90GHz
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 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 8 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
Byte Order: Little Endian
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
```

(Continued on next page)
### SPEC CPU2017 Floating Point Rate Result

**Hewlett Packard Enterprise**
**(Test Sponsor: HPE)**

**ProLiant DL380 Gen10**
**(1.90 GHz, Intel Xeon Gold 6262V)**

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

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>212</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE

**SPECrate2017_fp_base:** 212  
**SPECrate2017_fp_peak:** Not Run

**Test Date:** Jun-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Nov-2018

### Platform Notes (Continued)

- **CPU family:** 6  
- **Model:** 85  
- **Model name:** Intel(R) Xeon(R) Gold 6262V CPU @ 1.90GHz  
- **Stepping:** 7  
- **CPU MHz:** 1900.000  
- **BogoMIPS:** 3800.00  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 33792K  
- **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 mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperff perforf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtp rdtscp 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 cdp_l3 invpcid_single intel_ppin mba tpr_shadow vmni flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves cxsaveopt cxsave cqm_llc cqm_occyp_llc cqm_mbb_total cqm_mbb_local ibpb ibrs stib dtherm ida arat pln pts pkup ospke avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data  
`cache size : 33792 KB`

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 48 49 50 51 52 53 54 55 56 57 58 59  
- **Node 0 size:** 96276 MB  
- **Node 0 free:** 95753 MB  
- **Node 1 cpus:** 12 13 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71  
- **Node 1 size:** 96763 MB  
- **Node 1 free:** 94572 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:** 96528 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:** 96535 MB  
- **Node 3 free:** 96292 MB  

**node distances:**  
`node 0 1 2 3`

(Continued on next page)
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Platform Notes (Continued)

0:  10  21  31  31
1:  21  10  31  31
2:  31  31  10  21
3:  31  31  21  10

From /proc/meminfo
MemTotal: 395611832 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 15

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

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

uname -a:
Linux linux-ta8j 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Jun 22 07:08

SPEC is set to: /home/cpu2017
Files system Type Size Used Avail Use% Mounted on
/dev/sdb1 btrfs 895G 57G 837G 7% /home

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.

BIOS HPE U30 04/18/2019
Memory:

(Continued on next page)
Platform Notes (Continued)

24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base)
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC  511.povray_r(base) 526.blender_r(base)
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  507.cactuBSSN_r(base)
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
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(Continued on next page)
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Compiler Version Notes (Continued)

==============================================================================
FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC  521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpcc -m64

Fortran benchmarks:
ifort -m64

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

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

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64

(Continued on next page)
## Base Portability Flags (Continued)

<table>
<thead>
<tr>
<th>Base Portability Flags</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>507.cactuBSSN_r:</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>508.namd_r:</td>
<td>-DSPEC_LP64</td>
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<td>510.parest_r:</td>
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</tr>
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<td>511.povray_r:</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>519.lbm_r:</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>521.wrf_r:</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
</tr>
<tr>
<td>526.blender_r:</td>
<td>-DSPEC_LP64 -DSPEC_LINUX -funsigned-char</td>
</tr>
<tr>
<td>527.cam4_r:</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG</td>
</tr>
<tr>
<td>538.imagick_r:</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>544.nab_r:</td>
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</tr>
<tr>
<td>554.roms_r:</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

## 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
- 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
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(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.90 GHz, Intel Xeon Gold 6262V)

SPECrate2017_fp_base = 212
SPECrate2017_fp_peak = Not Run

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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