## SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10 Plus  
(2.80 GHz, Intel Xeon Silver 4309Y)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>100</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
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**CPU2017 License:** 3  
**Test Date:** Aug-2021  
**Test Sponsor:** HPE  
**Hardware Availability:** Jun-2021  
**Tested by:** HPE  
**Software Availability:** Dec-2020

### Hardware

- **CPU Name:** Intel Xeon Silver 4309Y  
- **Max MHz:** 3600  
- **Nominal:** 2800  
- **Enabled:** 16 cores, 2 chips  
- **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:** Yes  
- **Firmware:** HPE BIOS Version U46 v1.42 05/16/2021 released May-2021  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
Hewlett Packard Enterprise  
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Results Table

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</table>

**SPECspeed®2017_fp_base = 100**

**SPECspeed®2017_fp_peak = 102**

### 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:
  - `KMP_AFFINITY = "granularity=fine,compact"
  - `LD_LIBRARY_PATH = "/home/cpu2017_1.1.8/lib/intel64:/home/cpu2017_1.1.8/je5.0.1-64"
  - `MALLOC_CONF = "retain:true"
  - `OMP_STACKSIZE = "192M"

### General Notes

- Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
- NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
- Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
- Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.
- Jemalloc, a general purpose malloc implementation

(Continued on next page)
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(Test Sponsor: HPE)
ProLiant DL380 Gen10 Plus
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SPECspeed®2017_fp_base = 100
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

General Notes (Continued)
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 0xd0002a0 for
the Intel Xeon Silver 4309Y processor
BIOS Configuration:
Workload Profile set to General Peak Frequency Compute
Intel Hyper-Threading set to Disabled
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Advanced Memory Protection set to Advanced ECC
Last Level Cache (LLC) Prefetch set to Enabled
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Workload Profile set to Custom
   Energy/Performance Bias set to Balanced Power
   DCU Stream Prefetcher set to Disabled
   Adjacent Sector Prefetch set to Disabled
   Minimum Processor Idle Power Package C-State set to No Package State
   Numa Group Size Optimization set to Flat

Sysinfo program /home/cpu2017_1.1.8/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d
running on localhost.localdomain Fri Jun 22 20:52:38 2018

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) Silver 4309Y CPU @ 2.80GHz
  2 "physical id"s (chips)
  16 "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 : 8
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7

From lscpu from util-linux 2.32.1:
Architecture:   x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order:     Little Endian

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

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SPECspeed®2017_fp_base = 100
SPECspeed®2017_fp_peak = 102

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

Platform Notes (Continued)

CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 2
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: 1140.192
BogoMIPS: 5600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 1228K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acp1 mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtps
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
xtr pdcm pclid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx fl64 rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 invpcid_single ssbd
mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnumi flexpriori ept vpid ept_ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq
rsseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw
avx512vl xsaveopt xsave xsave xsave xcgetbv1 xsaves cqm_llc cqm_occu_11c cqm_mm_total
qm_mbb_local split_lock Detect wbnoindv dtherm ida arat pit pts avx512vbm umip pku
ospe avx512_vbmi2 gfnf vaes vpcmldqdq avx512_vnni avx512_bitalg tme
avx512_vpopcntdq la57 rdpid md_clear pconfug flush_l1d arch_capabilities

/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
 node 0 size: 1022389 MB
 node 0 free: 1026044 MB
 node 1 cpus: 8 9 10 11 12 13 14 15
 node 1 size: 1023056 MB
 node 1 free: 1030015 MB
 node distances:
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Platform Notes (Continued)

node 0 1
  0: 10 20
  1: 20 10

From /proc/meminfo
MemTotal: 2113498736 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
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: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

(Continued on next page)
Hewlett Packard Enterprise
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CPU2017 License: 3
Test Date: Aug-2021
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**Platform Notes (Continued)**

run-level 3 Jun 22 16:41

SPEC is set to: /home/cpu2017_1.1.8

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 670G 125G 545G 19% /home
```

From /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL380 Gen10 Plus
Product Family: ProLiant
Serial: CN70490X8B

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:
- BIOS Vendor: HPE
- BIOS Version: U46
- BIOS Date: 05/16/2021
- BIOS Revision: 1.42
- Firmware Revision: 2.50

(End of data from sysinfo program)

---

**Compiler Version Notes**

```
C  619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base)
```

Intel (R) C 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  644.nab_s(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.
**Compiler Version Notes (Continued)**

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<td>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.</td>
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<tr>
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<td>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.</td>
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Compiler Version Notes (Continued)

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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.

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries

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**Base Optimization Flags (Continued)**

Fortran benchmarks:
- -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3  
- -no-prec-div -qopt-prefetch -ffinite-math-only  
- -qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs  
- -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib  
- -ljemalloc

Benchmarks using both Fortran and C:
- -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
- -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
- -DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs  
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
- -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
- -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
- -DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs  
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

**Peak Compiler Invocation**

C benchmarks (except as noted below):
- icc

644.nab_s: icx

Fortran benchmarks:
- ifort

Benchmarks using both Fortran and C:
- ifort icc

Benchmarks using Fortran, C, and C++:
- icpc icc ifort

**Peak Portability Flags**

Same as Base Portability Flags
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**Test Sponsor:** HPE  
**Hardware Availability:** Jun-2021  
**Software Availability:** Dec-2020

### Peak Optimization Flags

**C benchmarks:**

- 619.lbm_s: basepeak = yes
- 638.imagick_s: basepeak = yes
- 644.nab_s: -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
  -fno-mathlib -funroll-loops -fopenmp  
  -DSPEC_OPENMP -gostat -mem-layout-trans=4  
  -fimf-accuracy-bits=14:sqrt  
  -mbranace-within-32B-boundaries  
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

**Fortran benchmarks:**

- 603.bwaves_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)  
  -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512  
  -O3 -no-prec-div -gopt-prefetch -ffinite-math-only  
  -gopt-mem-layout-trans=4 -gopenmp -nostandard-realloc-lhs  
  -mbranace-within-32B-boundaries  
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 649.fotonik3d_s: basepeak = yes
- 654.roms_s: basepeak = yes

**Benchmarks using both Fortran and C:**

- 621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)  
  -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div  
  -gopt-prefetch -ffinite-math-only -gopt-mem-layout-trans=4  
  -DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP  
  -mbranace-within-32B-boundaries -nostandard-realloc-lhs  
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 627.cam4_s: basepeak = yes
- 628.pop2_s: basepeak = yes

**Benchmarks using Fortran, C, and C++:**

- 607.cactusBSSN_s: basepeak = yes
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10 Plus
(2.80 GHz, Intel Xeon Silver 4309Y)

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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

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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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