



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

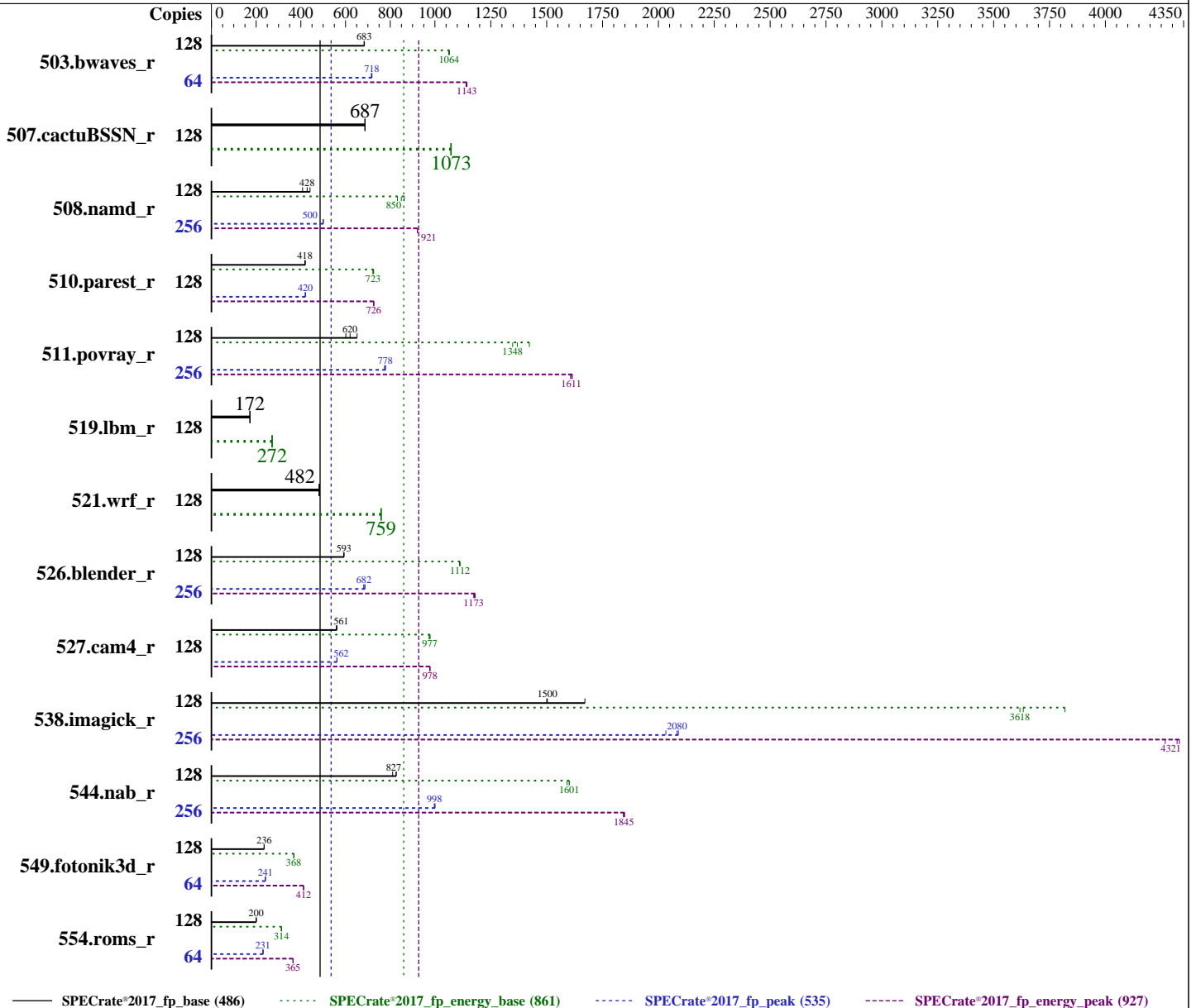
Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019



### Hardware

CPU Name: AMD EPYC 7702  
 Max MHz: 3350  
 Nominal: 2000  
 Enabled: 128 cores, 2 chips, 2 threads/core  
 Orderable: 1, 2 chip(s)

(Continued on next page)

### Software

OS: SUSE Linux Enterprise Server 15 (x86\_64) SP1  
 Kernel 4.12.14-195-default  
 Compiler: C/C++/Fortran: Version 2.0.0 of AOCC  
 Parallel: No  
 Firmware: HPE BIOS Version A40 07/20/2019 released Aug-2019

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

#### Hardware (Continued)

Cache L1: 32 KB I + 32 KB D on chip per core  
L2: 512 KB I+D on chip per core  
L3: 256 MB I+D on chip per chip,  
16 MB shared / 4 cores  
Other: None  
Memory: 1 TB (16 x 64 GB 4Rx4 PC4-2933Y-L)  
Storage: 1 x HPE 240 GB SATA 6G M.2 SSD  
Other: None

#### Software (Continued)

File System: btrfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: jemalloc: jemalloc memory allocator library v5.2.0  
Power Management: Disabled

#### Power

Max. Power (W): 727.5  
Idle Power (W): 204.83  
Min. Temperature (C): 23.13  
Elevation (m): 132  
Line Standard: 208 V / 60 Hz / 1 phase / 2 wires  
Provisioning: Line-powered

#### Power Settings

Management FW: Version 1.43 of iLO5 released May 23 2019  
Memory Mode: Normal

#### Power-Relevant Hardware

Power Supply: 1 x 800 W (non-redundant)  
Details: HPE 800W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit (865438-B21)  
Backplane: None  
Other Storage: Embedded SATA Controller  
Storage Model #s: 875488-B21  
NICs Installed: 1 x HPE Ethernet 4-port 331i Adapter @ 1 Gb  
NICs Enabled (FW/OS): 4 / 4  
NICs Connected/Speed: 2 @ 1 Gb  
Other HW Model #s: 6 x High Performance Fans (867810-B21)

#### Power Analyzer

Power Analyzer: 10.216.1.13:8888  
Hardware Vendor: Yokogawa  
Model: YokogawaWT210  
Serial Number: 91GC21887  
Input Connection: GPIB via NI GIPB-USB-HS  
Metrology Institute: NIST  
Calibration By: TRANSCAT  
Calibration Label: 5-E62NT-80-1  
Calibration Date: 11-Jun-2019  
PTDaemon™ Version: 1.9.1 (a2d19f26; 2019-07-17)  
Setup Description: SUT Power Supply 1 via neoXt NXB 20815  
Current Ranges Used: 1A, 5A  
Voltage Range Used: 300V

#### Temperature Meter

Temperature Meter: 10.216.1.13:8889  
Hardware Vendor: Digi International Inc.  
Model: DigiWATCHPORT\_H  
Serial Number: V45084325  
Input Connection: USB  
PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)  
Setup Description: 5 mm in front of SUT main intake

### Base Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
-----------	--------	---------	-------	-------------	--------------	---------------	---------------	---------	-------	-------------	--------------	---------------	---------------	---------	-------	-------------	--------------	---------------	---------------

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Base Results Table (Continued)

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	
503.bwaves_r	128	1875	685	1310	1070	700	710	1878	683	1320	1060	702	720	<b>1878</b>	<b>683</b>	<b>1320</b>	<b>1060</b>	<b>700</b>	<b>717</b>	
507.cactuBSSN_r	128	236	687	166	1070	705	713	236	688	166	1070	705	713	<b>236</b>	<b>687</b>	<b>166</b>	<b>1070</b>	<b>704</b>	<b>710</b>	
508.namd_r	128	<b>284</b>	<b>428</b>	<b>156</b>	<b>850</b>	<b>550</b>	<b>575</b>	298	408	159	832	534	572	276	441	154	863	557	575	
510.parest_r	128	797	420	502	726	630	665	<b>801</b>	<b>418</b>	<b>504</b>	<b>723</b>	<b>629</b>	<b>664</b>	801	418	504	723	629	664	
511.povray_r	128	497	601	237	1370	477	506	<b>482</b>	<b>620</b>	<b>241</b>	<b>1350</b>	<b>499</b>	<b>506</b>	459	652	228	1420	497	503	
519.lbm_r	128	782	173	565	271	722	728	783	172	565	271	721	727	<b>783</b>	<b>172</b>	<b>564</b>	<b>272</b>	<b>721</b>	<b>727</b>	
521.wrf_r	128	592	484	412	760	696	703	<b>595</b>	<b>482</b>	<b>412</b>	<b>759</b>	<b>693</b>	<b>705</b>	595	482	413	759	693	702	
526.blender_r	128	329	592	190	1110	578	683	329	593	190	1110	578	684	<b>329</b>	<b>593</b>	<b>190</b>	<b>1110</b>	<b>577</b>	<b>682</b>	
527.cam4_r	128	<b>399</b>	<b>561</b>	<b>249</b>	<b>977</b>	<b>625</b>	<b>705</b>	400	559	250	974	625	690	399	561	249	978	625	692	
538.imagick_r	128	<b>212</b>	<b>1500</b>	<b>95.3</b>	<b>3620</b>	<b>450</b>	<b>621</b>	190	1670	90.3	3820	474	474	623	212	1500	94.9	3630	447	628
544.nab_r	128	261	827	146	1600	560	596	<b>261</b>	<b>827</b>	<b>146</b>	<b>1600</b>	<b>560</b>	<b>596</b>	266	811	147	1590	552	596	
549.fotonik3d_r	128	<b>2114</b>	<b>236</b>	<b>1510</b>	<b>368</b>	<b>714</b>	<b>720</b>	2115	236	1510	369	712	719	2113	236	1500	369	712	719	
554.roms_r	128	1014	200	717	313	707	714	<b>1015</b>	<b>200</b>	<b>716</b>	<b>314</b>	<b>705</b>	<b>713</b>	1016	200	717	313	705	713	

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

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

## Peak Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
503.bwaves_r	64	897	715	614	1140	684	691	<b>894</b>	<b>718</b>	<b>612</b>	<b>1140</b>	<b>684</b>	<b>692</b>	894	718	612	1140	685	691
507.cactuBSSN_r	128	236	687	166	1070	705	713	236	688	166	1070	705	713	<b>236</b>	<b>687</b>	<b>166</b>	<b>1070</b>	<b>704</b>	<b>710</b>
508.namd_r	256	486	500	287	922	592	612	487	500	288	922	591	611	<b>486</b>	<b>500</b>	<b>288</b>	<b>921</b>	<b>592</b>	<b>610</b>
510.parest_r	128	797	420	502	726	630	665	<b>797</b>	<b>420</b>	<b>502</b>	<b>726</b>	<b>630</b>	<b>664</b>	796	420	501	727	629	665
511.povray_r	256	<b>768</b>	<b>778</b>	<b>403</b>	<b>1610</b>	<b>524</b>	<b>534</b>	767	779	402	1620	523	561	772	774	404	1610	523	567
519.lbm_r	128	782	173	565	271	722	728	783	172	565	271	721	727	<b>783</b>	<b>172</b>	<b>564</b>	<b>272</b>	<b>721</b>	<b>727</b>
521.wrf_r	128	592	484	412	760	696	703	<b>595</b>	<b>482</b>	<b>412</b>	<b>759</b>	<b>693</b>	<b>705</b>	595	482	413	759	693	702
526.blender_r	256	567	687	358	1180	631	700	<b>571</b>	<b>682</b>	<b>360</b>	<b>1170</b>	<b>630</b>	<b>694</b>	572	682	359	1180	628	698
527.cam4_r	128	399	561	249	977	625	687	<b>399</b>	<b>562</b>	<b>249</b>	<b>978</b>	<b>625</b>	<b>680</b>	398	562	249	977	626	695
538.imagick_r	256	305	2090	159	4330	522	694	313	2030	162	4270	516	691	<b>306</b>	<b>2080</b>	<b>160</b>	<b>4320</b>	<b>522</b>	<b>690</b>
544.nab_r	256	<b>432</b>	<b>998</b>	<b>253</b>	<b>1850</b>	<b>586</b>	<b>603</b>	432	998	253	1840	587	604	431	1000	253	1850	587	601
549.fotonik3d_r	64	<b>1034</b>	<b>241</b>	<b>674</b>	<b>412</b>	<b>652</b>	<b>661</b>	1034	241	674	412	652	661	1034	241	674	412	652	661
554.roms_r	64	<b>441</b>	<b>231</b>	<b>307</b>	<b>365</b>	<b>697</b>	<b>710</b>	440	231	307	366	697	711	442	230	307	365	696	709

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

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

## Compiler Notes

The AMD64 AOCC Compiler Suite is available at <http://developer.amd.com/amd-aocc/>

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores.  
See the configuration file for details.



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL385 Gen10**  
**(2.00 GHz, AMD EPYC 7702)**

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

**CPU2017 License:** 003

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** May-2019

**Hardware Availability:** Oct-2019

**Software Availability:** Aug-2019

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:  
numactl --interleave=all runcpu <etc>

Set dirty\_ratio=8 to limit dirty cache to 8% of memory  
Set swappiness=1 to swap only if necessary  
Set zone\_reclaim\_mode=1 to free local node memory and avoid remote memory  
sync then drop\_caches=3 to reset caches before invoking runcpu

dirty\_ratio, swappiness, zone\_reclaim\_mode and drop\_caches were  
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)

The date was incorrectly set for this system. The test date should be Aug-2019.

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =  
    "/cpu2017/amd_rate_aocc200_rome_C_lib/64;/cpu2017/amd_rate_aocc200_rome_  
    C_lib/32:"
```

```
MALLOC_CONF = "retain:true"
```

## General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto  
jemalloc 5.2.0 is available here:

<https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2>

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## General Notes (Continued)

Submitted\_by: "Bucek, James" <james.bucek@hpe.com>

Submitted: Tue Sep 17 00:02:18 EDT 2019

Submission: cpu2017-20190903-17796.sub

## Platform Notes

BIOS Configuration:

Thermal Configuration set to Optimal Cooling

Determinism Control set to Manual

Performance Determinism set to Power Deterministic

Memory Patrol Scrubbing set to Disabled

NUMA memory domains per socket set to Four memory domains per socket

Last-Level Cache (LLC) as NUMA Node set to Enabled

Workload Profile set to General Throughput Compute

Minimum Processor Idle Power Core C-State set to C6 State

Sysinfo program /cpu2017/bin/sysinfo

Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011

running on dl385gen10 Mon May 27 20:14:14 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 : AMD EPYC 7702 64-Core Processor

2 "physical id"s (chips)

256 "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 : 64

siblings : 128

physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 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 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52  
53 54 55 56 57 58 59 60 61 62 63

physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 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 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52  
53 54 55 56 57 58 59 60 61 62 63

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

Address sizes: 48 bits physical, 48 bits virtual

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

### Platform Notes (Continued)

```

CPU(s): 256
On-line CPU(s) list: 0-255
Thread(s) per core: 2
Core(s) per socket: 64
Socket(s): 2
NUMA node(s): 32
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7702 64-Core Processor
Stepping: 0
CPU MHz: 2000.000
CPU max MHz: 2000.0000
CPU min MHz: 1500.0000
BogoMIPS: 3992.35
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-3,128-131
NUMA node1 CPU(s): 4-7,132-135
NUMA node2 CPU(s): 8-11,136-139
NUMA node3 CPU(s): 12-15,140-143
NUMA node4 CPU(s): 16-19,144-147
NUMA node5 CPU(s): 20-23,148-151
NUMA node6 CPU(s): 24-27,152-155
NUMA node7 CPU(s): 28-31,156-159
NUMA node8 CPU(s): 32-35,160-163
NUMA node9 CPU(s): 36-39,164-167
NUMA node10 CPU(s): 40-43,168-171
NUMA node11 CPU(s): 44-47,172-175
NUMA node12 CPU(s): 48-51,176-179
NUMA node13 CPU(s): 52-55,180-183
NUMA node14 CPU(s): 56-59,184-187
NUMA node15 CPU(s): 60-63,188-191
NUMA node16 CPU(s): 64-67,192-195
NUMA node17 CPU(s): 68-71,196-199
NUMA node18 CPU(s): 72-75,200-203
NUMA node19 CPU(s): 76-79,204-207
NUMA node20 CPU(s): 80-83,208-211
NUMA node21 CPU(s): 84-87,212-215
NUMA node22 CPU(s): 88-91,216-219
NUMA node23 CPU(s): 92-95,220-223
NUMA node24 CPU(s): 96-99,224-227

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Platform Notes (Continued)

NUMA node25 CPU(s): 100-103,228-231  
 NUMA node26 CPU(s): 104-107,232-235  
 NUMA node27 CPU(s): 108-111,236-239  
 NUMA node28 CPU(s): 112-115,240-243  
 NUMA node29 CPU(s): 116-119,244-247  
 NUMA node30 CPU(s): 120-123,248-251  
 NUMA node31 CPU(s): 124-127,252-255

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov  
 pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr\_opt pdpe1gb rdtscp lm  
 constant\_tsc rep\_good nopl xtopology nonstop\_tsc cpuid extd\_apicid aperfmperf pni  
 pclmulqdq monitor ssse3 fma cx16 sse4\_1 sse4\_2 x2apic movbe popcnt aes xsave avx  
 f16c rdrand lahf\_lm cmp\_legacy svm extapic cr8\_legacy abm sse4a misalignsse  
 3dnowprefetch osvw ibs skinit wdt tce topoext perfctr\_core perfctr\_nb bpext  
 perfctr\_l2 mwaitx cpb cat\_l3 cdp\_l3 hw\_pstate ssbd ibrs ibpb stibp vmmcall fsgsbase  
 bmi1 avx2 smep bmi2 cqm rdt\_a rdseed adx smap clflushopt clwb sha\_ni xsaveopt xsavec  
 xgetbv1 xsaves cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local clzero irperf  
 xsaveerptr arat npt lbrv svm\_lock nrip\_save tsc\_scale vmcb\_clean flushbyasid  
 decodeassists pausefilter pfthreshold avic v\_vmsave\_vmload vgif umip rdpid  
 overflow\_recov succor smca

```
/proc/cpuinfo cache data
cache size : 512 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 32 nodes (0-31)
node 0 cpus: 0 1 2 3 128 129 130 131
node 0 size: 32036 MB
node 0 free: 31702 MB
node 1 cpus: 4 5 6 7 132 133 134 135
node 1 size: 32254 MB
node 1 free: 31971 MB
node 2 cpus: 8 9 10 11 136 137 138 139
node 2 size: 32254 MB
node 2 free: 31974 MB
node 3 cpus: 12 13 14 15 140 141 142 143
node 3 size: 32253 MB
node 3 free: 31959 MB
node 4 cpus: 16 17 18 19 144 145 146 147
node 4 size: 32254 MB
node 4 free: 31973 MB
node 5 cpus: 20 21 22 23 148 149 150 151
node 5 size: 32254 MB
node 5 free: 31974 MB
node 6 cpus: 24 25 26 27 152 153 154 155
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Platform Notes (Continued)

```

node 6 size: 32254 MB
node 6 free: 31972 MB
node 7 cpus: 28 29 30 31 156 157 158 159
node 7 size: 32253 MB
node 7 free: 31973 MB
node 8 cpus: 32 33 34 35 160 161 162 163
node 8 size: 32254 MB
node 8 free: 31948 MB
node 9 cpus: 36 37 38 39 164 165 166 167
node 9 size: 32254 MB
node 9 free: 31976 MB
node 10 cpus: 40 41 42 43 168 169 170 171
node 10 size: 32254 MB
node 10 free: 31963 MB
node 11 cpus: 44 45 46 47 172 173 174 175
node 11 size: 32253 MB
node 11 free: 31974 MB
node 12 cpus: 48 49 50 51 176 177 178 179
node 12 size: 32254 MB
node 12 free: 31973 MB
node 13 cpus: 52 53 54 55 180 181 182 183
node 13 size: 32254 MB
node 13 free: 31975 MB
node 14 cpus: 56 57 58 59 184 185 186 187
node 14 size: 32254 MB
node 14 free: 31982 MB
node 15 cpus: 60 61 62 63 188 189 190 191
node 15 size: 32241 MB
node 15 free: 31970 MB
node 16 cpus: 64 65 66 67 192 193 194 195
node 16 size: 32254 MB
node 16 free: 31979 MB
node 17 cpus: 68 69 70 71 196 197 198 199
node 17 size: 32254 MB
node 17 free: 31975 MB
node 18 cpus: 72 73 74 75 200 201 202 203
node 18 size: 32254 MB
node 18 free: 31974 MB
node 19 cpus: 76 77 78 79 204 205 206 207
node 19 size: 32253 MB
node 19 free: 31975 MB
node 20 cpus: 80 81 82 83 208 209 210 211
node 20 size: 32254 MB
node 20 free: 31973 MB
node 21 cpus: 84 85 86 87 212 213 214 215

```

(Continued on next page)





# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
**ProLiant DL385 Gen10**  
**(2.00 GHz, AMD EPYC 7702)**

SPECrate®2017\_fp\_base = 486  
SPECrate®2017\_fp\_energy\_base = 861  
SPECrate®2017\_fp\_peak = 535  
SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003  
Test Sponsor: HPE  
Tested by: HPE

Test Date: May-2019  
Hardware Availability: Oct-2019  
Software Availability: Aug-2019

## Platform Notes (Continued)

```

node 21 size: 32254 MB
node 21 free: 31973 MB
node 22 cpus: 88 89 90 91 216 217 218 219
node 22 size: 32254 MB
node 22 free: 31974 MB
node 23 cpus: 92 93 94 95 220 221 222 223
node 23 size: 32253 MB
node 23 free: 31977 MB
node 24 cpus: 96 97 98 99 224 225 226 227
node 24 size: 32254 MB
node 24 free: 31979 MB
node 25 cpus: 100 101 102 103 228 229 230 231
node 25 size: 32254 MB
node 25 free: 31978 MB
node 26 cpus: 104 105 106 107 232 233 234 235
node 26 size: 32254 MB
node 26 free: 31974 MB
node 27 cpus: 108 109 110 111 236 237 238 239
node 27 size: 32253 MB
node 27 free: 31976 MB
node 28 cpus: 112 113 114 115 240 241 242 243
node 28 size: 32224 MB
node 28 free: 31946 MB
node 29 cpus: 116 117 118 119 244 245 246 247
node 29 size: 32254 MB
node 29 free: 31979 MB
node 30 cpus: 120 121 122 123 248 249 250 251
node 30 size: 32254 MB
node 30 free: 31974 MB
node 31 cpus: 124 125 126 127 252 253 254 255
node 31 size: 32250 MB
node 31 free: 31973 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
20 21 22 23 24 25 26 27 28 29 30 31
0: 10 11 11 11 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32
32 32 32 32 32 32 32 32 32 32 32 32
1: 11 10 11 11 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32
32 32 32 32 32 32 32 32 32 32 32 32
2: 11 11 10 11 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32
32 32 32 32 32 32 32 32 32 32 32 32
3: 11 11 11 10 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32
32 32 32 32 32 32 32 32 32 32 32 32
4: 12 12 12 12 10 11 11 11 12 12 12 12 12 12 12 32 32 32 32
32 32 32 32 32 32 32 32 32 32 32 32

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003  
Test Sponsor: HPE  
Tested by: HPE

Test Date: May-2019  
Hardware Availability: Oct-2019  
Software Availability: Aug-2019

### Platform Notes (Continued)

5:	12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
6:	12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
7:	12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
8:	12	12	12	12	12	12	12	12	10	11	11	11	12	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
9:	12	12	12	12	12	12	12	12	12	11	10	11	11	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
10:	12	12	12	12	12	12	12	12	12	11	11	10	11	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
11:	12	12	12	12	12	12	12	12	12	11	11	11	10	12	12	12	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
12:	12	12	12	12	12	12	12	12	12	12	12	12	12	10	11	11	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
13:	12	12	12	12	12	12	12	12	12	12	12	12	12	11	10	11	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
14:	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
15:	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	32	32	32	32			
32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32							
16:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	10	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12							
17:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	10	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12							
18:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	10	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12							
19:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	10
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12							
20:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12							
21:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12							
22:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	12	12							
23:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	12	12							
24:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	12	12							
25:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	12	12							
26:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12
12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	12	12							
27:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003  
Test Sponsor: HPE  
Tested by: HPE

Test Date: May-2019  
Hardware Availability: Oct-2019  
Software Availability: Aug-2019

### Platform Notes (Continued)

```

12 12 12 12 11 11 11 10 12 12 12 12
28: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12
12 12 12 12 12 12 12 12 10 11 11 11
29: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12
12 12 12 12 12 12 12 12 11 10 11 11
30: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12
12 12 12 12 12 12 12 12 11 11 10 11
31: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12
12 12 12 12 12 12 12 12 11 11 11 10

```

From /proc/meminfo

```

MemTotal:      1056634372 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

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

```

os-release:
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 dl385gen10 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: Full AMD retpoline, IBPB:
conditional, IBRS_FW, STIBP: conditional, RSB
filling

```

run-level 3 May 27 09:25

SPEC is set to: /cpu2017

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
**ProLiant DL385 Gen10**  
**(2.00 GHz, AMD EPYC 7702)**

SPECrate®2017\_fp\_base = 486  
SPECrate®2017\_fp\_energy\_base = 861  
SPECrate®2017\_fp\_peak = 535  
SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003  
Test Sponsor: HPE  
Tested by: HPE

Test Date: May-2019  
Hardware Availability: Oct-2019  
Software Availability: Aug-2019

## Platform Notes (Continued)

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	btrfs	222G	43G	178G	20%	/

```
From /sys/devices/virtual/dmi/id
BIOS: HPE A40 07/20/2019
Vendor: HPE
Product: ProLiant DL385 Gen10
Product Family: ProLiant
Serial: 7CE724P4SJ
```

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:
16x UNKNOWN NOT AVAILABLE
16x UNKNOWN NOT AVAILABLE 64 GB 4 rank 2933
```

(End of data from sysinfo program)

## Power Settings Notes

PTDaemon to measure power and temperature was run on a ProLiant DL360 Gen9 as a controller with 2x Intel Xeon E5-2660 v3 CPU and 128 GB of memory using Windows Server 2012 R2. Power management in the OS was disabled by setting Linux CPU governor to performance for all cores: `cpupower frequency-set -r -g performance`

Power management in the BIOS was default except for any settings mentioned in BIOS Configuration. No power management settings were set in the management firmware. The Embedded SATA controller was the HPE Smart Array S100i SR Gen10 SW RAID. The system was configured with 3 drive cage blanks, 6 High Performance Fans, 16 DIMM blanks, 2 high performance heatsinks (882098-B21) and baffles that fit over the high performance heatsinks in order to produce correct airflow and cooling. The run was started and observed through the management firmware.

## Compiler Version Notes

```
=====
C | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
  | 544.nab_r(base, peak)
-----
```

```
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

**CPU2017 License:** 003  
**Test Sponsor:** HPE  
**Tested by:** HPE

**Test Date:** May-2019  
**Hardware Availability:** Oct-2019  
**Software Availability:** Aug-2019

## Compiler Version Notes (Continued)

Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

=====  
C++ | 508.namd\_r(base, peak) 510.parest\_r(base, peak)  
=====

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

=====  
C++, C | 511.povray\_r(base, peak) 526.blender\_r(base, peak)  
=====

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

=====  
C++, C, Fortran | 507.cactuBSSN\_r(base, peak)  
=====

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

**CPU2017 License:** 003  
**Test Sponsor:** HPE  
**Tested by:** HPE

**Test Date:** May-2019  
**Hardware Availability:** Oct-2019  
**Software Availability:** Aug-2019

## Compiler Version Notes (Continued)

Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

-----  
Fortran | 503.bwaves\_r(base, peak) 549.fotonik3d\_r(base, peak)  
554.roms\_r(base, peak)

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

-----  
Fortran, C | 521.wrf\_r(base, peak) 527.cam4\_r(base, peak)  
-----

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

## Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
flang

Benchmarks using both Fortran and C:  
flang clang

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Base Compiler Invocation (Continued)

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

## 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\_CASE\_FLAG -Mbyteswapio -DSPEC\_LP64  
 526.blender\_r: -funsigned-char -D\_\_BOOL\_DEFINED -DSPEC\_LP64  
 527.cam4\_r: -DSPEC\_CASE\_FLAG -DSPEC\_LP64  
 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:

-flto -Wl,-mllvm -Wl,-function-specialize  
 -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC  
 -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math  
 -march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50  
 -fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist  
 -mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp  
 -mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000  
 -flv-function-specialization -z muldefs -lmvec -lamdlibm -ljemalloc  
 -lflang

C++ benchmarks:

-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -lmvec -lamdlibm
-ljemalloc -lflang
```

Fortran benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang
```

Benchmarks using both Fortran and C:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-freemap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -funroll-loops -Mrecursive -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang
```

Benchmarks using both C and C++:

```
-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mllvm -unroll-threshold=50 -freemap-arrays
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch -z muldefs
-lmvec -lamdlibm -ljemalloc -lflang
```

Benchmarks using Fortran, C, and C++:

```
-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

(Continued on next page)





# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch
-funroll-loops -Mrecursive -z muldefs -Kieee -fno-finite-math-only
-lmvec -lamdlibm -ljemalloc -lflang
```

## Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

## Peak Portability Flags

Same as Base Portability Flags



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003

Test Sponsor: HPE

Tested by: HPE

Test Date: May-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Peak Optimization Flags

C benchmarks:

519.lbm\_r: basepeak = yes

```
538.imagick_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -lmvec -lamdlibm -ljemalloc
-lflang
```

544.nab\_r: Same as 538.imagick\_r

C++ benchmarks:

```
508.namd_r: -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -lmvec -lamdlibm -ljemalloc
-lflang
```

```
510.parest_r: -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -Ofast -march=znver2
-flv-function-specialization -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -lmvec -lamdlibm -ljemalloc
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003  
Test Sponsor: HPE  
Tested by: HPE

Test Date: May-2019  
Hardware Availability: Oct-2019  
Software Availability: Aug-2019

## Peak Optimization Flags (Continued)

510.parest\_r (continued):  
-lflang

Fortran benchmarks:

```
503.bwaves_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3
-march=znver2 -funroll-loops -Mrecursive
-mllvm -vector-library=LIBMVEC -Kieee
-fno-finite-math-only -lmvec -lamdlibm -ljemalloc
-lflang
```

549.fotonik3d\_r: Same as 503.bwaves\_r

```
554.roms_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc
-lflang
```

Benchmarks using both Fortran and C:

521.wrf\_r: basepeak = yes

```
527.cam4_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -O3 -funroll-loops
-Mrecursive -Kieee -fno-finite-math-only -lmvec
-lamdlibm -ljemalloc -lflang
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

CPU2017 License: 003  
Test Sponsor: HPE  
Tested by: HPE

Test Date: May-2019  
Hardware Availability: Oct-2019  
Software Availability: Aug-2019

## Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

```
511.povray_r: -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000 -lmvec -lamdlibm
-ljemalloc -lflang
```

```
526.blender_r: -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000 -lmvec -lamdlibm
-ljemalloc -lflang
```

Benchmarks using Fortran, C, and C++:

507.cactuBSSN\_r: basepeak = yes

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1.html>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revF.html>



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL385 Gen10 (2.00 GHz, AMD EPYC 7702)

SPECrate®2017\_fp\_base = 486

SPECrate®2017\_fp\_energy\_base = 861

SPECrate®2017\_fp\_peak = 535

SPECrate®2017\_fp\_energy\_peak = 927

**CPU2017 License:** 003

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** May-2019

**Hardware Availability:** Oct-2019

**Software Availability:** Aug-2019

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1.xml>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revF.xml>

PTDaemon, SPEC CPU, and SPECrate are trademarks or 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](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.0 on 2019-05-27 21:14:13-0400.

Report generated on 2019-09-17 16:18:57 by CPU2017 PDF formatter v6255.

Originally published on 2019-09-17.