



# SPEC CPU®2017 Floating Point Rate Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### Superdome Flex 280

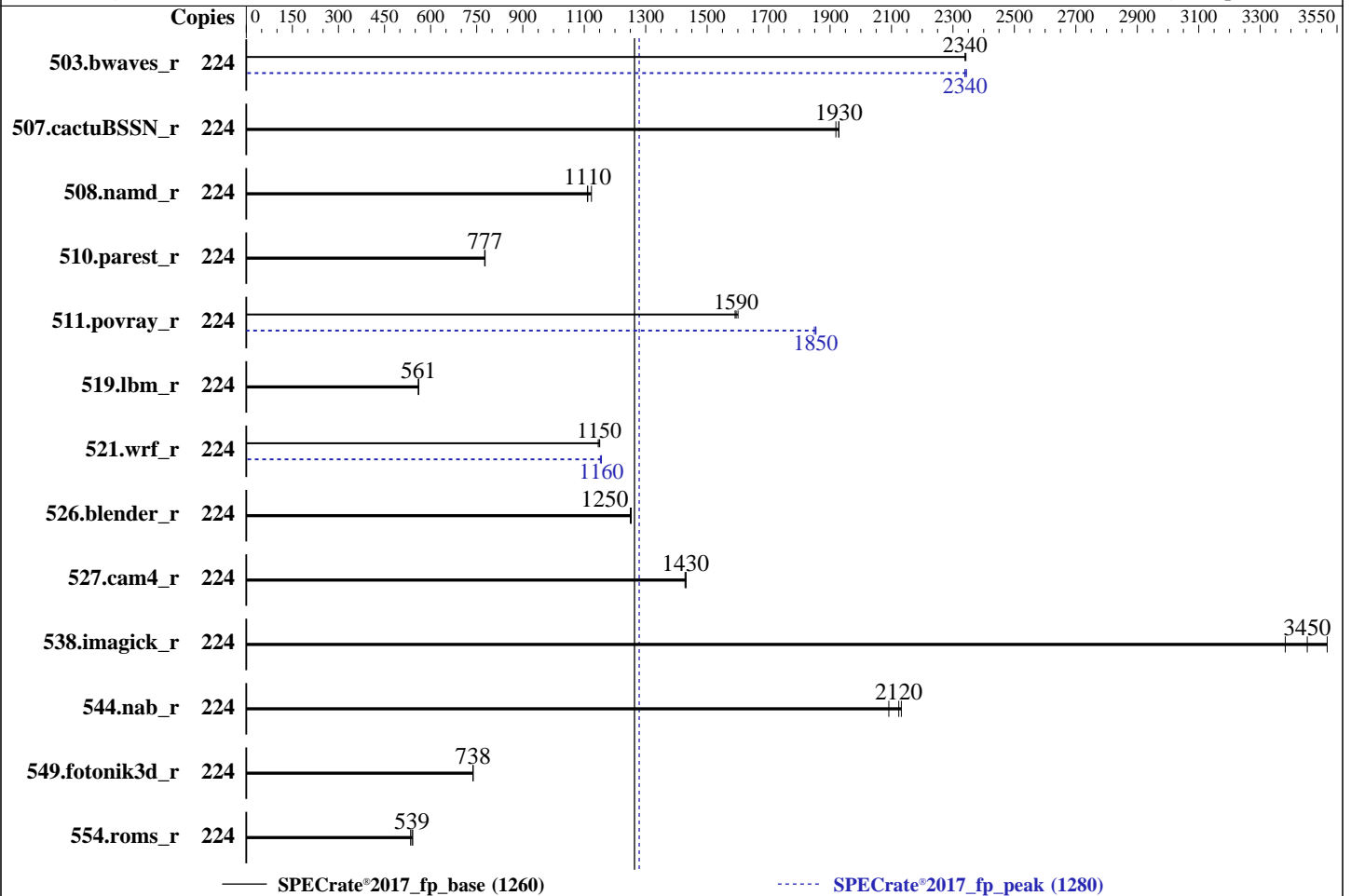
(2.90 GHz, Intel Xeon Platinum 8380H)

SPECrate®2017\_fp\_base = 1260

SPECrate®2017\_fp\_peak = 1280

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

Test Date: Oct-2020  
Hardware Availability: Oct-2020  
Software Availability: Apr-2020



### Hardware

CPU Name: Intel Xeon Platinum 8380H  
 Max MHz: 4300  
 Nominal: 2900  
 Enabled: 224 cores, 8 chips  
 Orderable: 2, 4, 8 chip(s)  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 38.5 MB I+D on chip per chip  
 Other: None  
 Memory: 6 TB (48 x 128 GB 4Rx4 PC4-3200AA-L)  
 Storage: 2 x 480 GB SSD SATA  
 Other: None

### Software

OS: Red Hat Enterprise Linux release 8.2 (Ootpa)  
 Kernel 4.18.0-193.el8.x86\_64  
 Compiler: C/C++: Version 19.1.1.217 of Intel C/C++  
 Compiler Build 20200306 for Linux;  
 Fortran: Version 19.1.1.217 of Intel Fortran  
 Compiler Build 20200306 for Linux;  
 Parallel: No  
 Firmware: HPE Firmware Bundle Version 1.0.140 released Oct-2020  
 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;  
 HPE Foundation Software 2.4,  
 Build 734.0820.200723T0100.a.rhel82hpe-200723T0100  
 Power Management: BIOS set to prefer performance at the cost of additional power usage



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## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	224	959	2340	<b>960</b>	<b>2340</b>	960	2340	224	958	2340	960	2340	<b>960</b>	<b>2340</b>
507.cactuBSSN_r	224	<b>147</b>	<b>1930</b>	147	1930	148	1920	224	<b>147</b>	<b>1930</b>	147	1930	148	1920
508.namd_r	224	<b>191</b>	<b>1110</b>	189	1120	192	1110	224	<b>191</b>	<b>1110</b>	189	1120	192	1110
510.parest_r	224	754	777	755	776	<b>754</b>	<b>777</b>	224	754	777	755	776	<b>754</b>	<b>777</b>
511.povray_r	224	<b>328</b>	<b>1590</b>	329	1590	327	1600	224	283	1850	282	1850	<b>282</b>	<b>1850</b>
519.lbm_r	224	421	560	421	561	<b>421</b>	<b>561</b>	224	421	560	421	561	<b>421</b>	<b>561</b>
521.wrf_r	224	<b>437</b>	<b>1150</b>	438	1150	436	1150	224	435	1150	<b>434</b>	<b>1160</b>	434	1160
526.blender_r	224	<b>272</b>	<b>1250</b>	272	1250	273	1250	224	<b>272</b>	<b>1250</b>	272	1250	273	1250
527.cam4_r	224	274	1430	274	1430	<b>274</b>	<b>1430</b>	224	274	1430	274	1430	<b>274</b>	<b>1430</b>
538.imagick_r	224	165	3380	<b>161</b>	<b>3450</b>	158	3520	224	165	3380	<b>161</b>	<b>3450</b>	158	3520
544.nab_r	224	180	2090	177	2130	<b>178</b>	<b>2120</b>	224	180	2090	177	2130	<b>178</b>	<b>2120</b>
549.fotonik3d_r	224	<b>1183</b>	<b>738</b>	1182	738	1184	737	224	<b>1183</b>	<b>738</b>	1182	738	1184	737
554.roms_r	224	657	542	666	535	<b>660</b>	<b>539</b>	224	657	542	666	535	<b>660</b>	<b>539</b>

**SPECrate®2017\_fp\_base = 1260**

**SPECrate®2017\_fp\_peak = 1280**

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>  
Tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
LD\_LIBRARY\_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"  
MALLOCONF = "retain:true"



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## 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 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5 sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

## Platform Notes

BIOS Configuration:

Workload Profile set to HPC  
Hyper-Threading set to Disabled  
Workload Profile set to Custom  
Minimum Processor Idle Power Core C-State set to C6 State  
Sub-NUMA Clustering set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on ch-622.fchst.rdlabs.hpccorp.net Thu Oct 8 18:35:46 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) Platinum 8380H CPU @ 2.90GHZ
 8 "physical id"s (chips)
224 "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 : 28
siblings : 28
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
```

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## Platform Notes (Continued)

```
28 29 30
physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 6: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 7: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
```

From `lscpu`:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                224
On-line CPU(s) list:  0-223
Thread(s) per core:    1
Core(s) per socket:    28
Socket(s):             8
NUMA node(s):         16
Vendor ID:             GenuineIntel
CPU family:            6
Model:                85
Model name:            Intel(R) Xeon(R) Platinum 8380H CPU @ 2.90GHz
Stepping:              11
CPU MHz:               3646.587
CPU max MHz:           4300.0000
CPU min MHz:           1000.0000
BogoMIPS:              5799.88
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              39424K
NUMA node0 CPU(s):    0-3,7-9,14-17,21-23
NUMA node1 CPU(s):    4-6,10-13,18-20,24-27
NUMA node2 CPU(s):    28-31,35-37,42-45,49-51
NUMA node3 CPU(s):    32-34,38-41,46-48,52-55
NUMA node4 CPU(s):    56-59,63-65,70-73,77-79
NUMA node5 CPU(s):    60-62,66-69,74-76,80-83
NUMA node6 CPU(s):    84-87,91-93,98-101,105-107
NUMA node7 CPU(s):    88-90,94-97,102-104,108-111
NUMA node8 CPU(s):    112-115,119-121,126-129,133-135
NUMA node9 CPU(s):    116-118,122-125,130-132,136-139
NUMA node10 CPU(s):   140-143,147-149,154-157,161-163
NUMA node11 CPU(s):   144-146,150-153,158-160,164-167
NUMA node12 CPU(s):   168-171,175-177,182-185,189-191
NUMA node13 CPU(s):   172-174,178-181,186-188,192-195
NUMA node14 CPU(s):   196-199,203-205,210-213,217-219
```

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## Platform Notes (Continued)

NUMA node15 CPU(s): 200-202,206-209,214-216,220-223

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant\_tsc art arch\_perfmon pebs bts rep\_good nopl xtopology nonstop\_tsc cpuid aperfperf 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 tsc\_deadline\_timer aes xsave avx f16c rdrand lahf\_lm abm 3dnowprefetch cpuid\_fault epb cat\_l3 cdp\_l3 invpcid\_single intel\_ppin ssbd mba ibrs ibpb stibp ibrs\_enhanced tpr\_shadow vnmi 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 xsavec xgetbv1 xsaves cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local avx512\_bf16 dtherm ida arat pln pts pku ospke avx512\_vnni md\_clear flush\_lld arch\_capabilities

```
/proc/cpuinfo cache data
cache size : 39424 KB
```

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

```
available: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23
node 0 size: 385509 MB
node 0 free: 385321 MB
node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27
node 1 size: 387068 MB
node 1 free: 386894 MB
node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51
node 2 size: 387068 MB
node 2 free: 386921 MB
node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55
node 3 size: 387068 MB
node 3 free: 386939 MB
node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79
node 4 size: 387068 MB
node 4 free: 386935 MB
node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83
node 5 size: 387068 MB
node 5 free: 386978 MB
node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107
node 6 size: 387068 MB
node 6 free: 386983 MB
node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111
node 7 size: 387068 MB
node 7 free: 386976 MB
node 8 cpus: 112 113 114 115 119 120 121 126 127 128 129 133 134 135
node 8 size: 387068 MB
node 8 free: 386982 MB
```

(Continued on next page)



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## Platform Notes (Continued)

```

node 9 cpus: 116 117 118 122 123 124 125 130 131 132 136 137 138 139
node 9 size: 387068 MB
node 9 free: 386974 MB
node 10 cpus: 140 141 142 143 147 148 149 154 155 156 157 161 162 163
node 10 size: 387068 MB
node 10 free: 386976 MB
node 11 cpus: 144 145 146 150 151 152 153 158 159 160 164 165 166 167
node 11 size: 387068 MB
node 11 free: 386976 MB
node 12 cpus: 168 169 170 171 175 176 177 182 183 184 185 189 190 191
node 12 size: 387068 MB
node 12 free: 386981 MB
node 13 cpus: 172 173 174 178 179 180 181 186 187 188 192 193 194 195
node 13 size: 387040 MB
node 13 free: 386949 MB
node 14 cpus: 196 197 198 199 203 204 205 210 211 212 213 217 218 219
node 14 size: 387068 MB
node 14 free: 386807 MB
node 15 cpus: 200 201 202 206 207 208 209 214 215 216 220 221 222 223
node 15 size: 386036 MB
node 15 free: 385166 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 0:  10 13 16 16 16 16 24 24 16 16 16 16 16 16 16 16
 1:  13 10 16 16 16 16 24 24 16 16 16 16 16 16 16 16
 2:  16 16 10 13 24 24 16 16 16 16 16 16 16 16 16 16
 3:  16 16 13 10 24 24 16 16 16 16 16 16 16 16 16 16
 4:  16 16 24 24 10 13 16 16 16 16 16 16 16 16 16 16
 5:  16 16 24 24 13 10 16 16 16 16 16 16 16 16 16 16
 6:  24 24 16 16 16 16 10 13 16 16 16 16 16 16 16 16
 7:  24 24 16 16 16 16 13 10 16 16 16 16 16 16 16 16
 8:  16 16 16 16 16 16 16 16 10 13 16 16 16 16 24 24
 9:  16 16 16 16 16 16 16 16 13 10 16 16 16 16 24 24
10:  16 16 16 16 16 16 16 16 16 16 10 13 24 24 16 16
11:  16 16 16 16 16 16 16 16 16 16 13 10 24 24 16 16
12:  16 16 16 16 16 16 16 16 16 16 24 24 10 13 16 16
13:  16 16 16 16 16 16 16 16 16 16 24 24 13 10 16 16
14:  16 16 16 16 16 16 16 16 16 24 24 16 16 16 10 13
15:  16 16 16 16 16 16 16 16 24 24 16 16 16 16 13 10

```

```

From /proc/meminfo
MemTotal:      6339047124 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
Red Hat Enterprise Linux release 8.2 (Ootpa)

```

(Continued on next page)



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## Platform Notes (Continued)

```

From /etc/*release* /etc/*version*
  hpe-foundation-release: HPE Foundation Software 2.4, Build
  734.0820.200723T0100.a.rhel82hpe-200723T0100
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.2 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.2"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
    ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
  Linux ch-622.fchst.rdlabs.hpecorp.net 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58
  UTC 2020 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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
tsx_async_abort:                             Not affected

run-level 3 Oct 8 18:33

SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   392G   32G  360G   9% /home

From /sys/devices/virtual/dmi/id
  BIOS:      HPE Bundle:1.0.140 SFW:008.000.188.000.2010060501 10/06/2020
  Vendor:    HPE
  Product:   Superdome Flex 280
  Product Family: 1590PID02020001
  Serial:    5UF0090539

```

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## Platform Notes (Continued)

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:

48x Hynix HMABAGL7ABR4N-XN 128 GB 4 rank 3200  
48x NO DIMM NO DIMM

(End of data from sysinfo program)

## Compiler Version Notes

=====  
C | 519.lbm\_r(base, peak) 538.imagick\_r(base, peak)  
| 544.nab\_r(base, peak)  
=====

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
=====

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

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
=====

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

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
=====

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

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306

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Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306

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

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

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304

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

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304

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

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

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
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Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306

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

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

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304

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

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304

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

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.1.1.217 Build 20200306

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

=====  
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)

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**SPECrate®2017\_fp\_peak = 1280**

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

**Test Date:** Oct-2020  
**Hardware Availability:** Oct-2020  
**Software Availability:** Apr-2020

## Compiler Version Notes (Continued)

64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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

-----  
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====  
Fortran, C | 521.wrf\_r(peak)

-----  
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306  
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=====  
Fortran, C | 521.wrf\_r(base) 527.cam4\_r(base, peak)

-----  
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
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=====  
Fortran, C | 521.wrf\_r(peak)

-----  
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306  
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# SPEC CPU®2017 Floating Point Rate Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**Superdome Flex 280**

(2.90 GHz, Intel Xeon Platinum 8380H)

**SPECrate®2017\_fp\_base = 1260**

**SPECrate®2017\_fp\_peak = 1280**

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Oct-2020

**Hardware Availability:** Oct-2020

**Software Availability:** Apr-2020

## Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

ifort icc

Benchmarks using both C and C++:

icpc icc

Benchmarks using Fortran, C, and C++:

icpc icc ifort

## 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:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

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**Test Date:** Oct-2020

**Hardware Availability:** Oct-2020

**Software Availability:** Apr-2020

## Base Optimization Flags (Continued)

### C++ benchmarks:

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

### Fortran benchmarks:

```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
-fuse-ld=gold -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-multiple-gather-scatter-by-shuffles  
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte  
-auto -mbranches-within-32B-boundaries  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

### Benchmarks using both Fortran and C:

```
-m64 -qnextgen -std=c11  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse  
-funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div  
-qopt-prefetch -ffinite-math-only  
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs  
-align array32byte -auto -mbranches-within-32B-boundaries  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

### Benchmarks using both C and C++:

```
-m64 -qnextgen -std=c11  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse  
-funroll-loops -qopt-mem-layout-trans=4  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

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

```
-m64 -qnextgen -std=c11  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse  
-funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div  
-qopt-prefetch -ffinite-math-only  
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs  
-align array32byte -auto -mbranches-within-32B-boundaries  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```



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**Superdome Flex 280**

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**SPECrate®2017\_fp\_base = 1260**

**SPECrate®2017\_fp\_peak = 1280**

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Oct-2020

**Hardware Availability:** Oct-2020

**Software Availability:** Apr-2020

## Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

ifort icc

Benchmarks using both C and C++:

icpc icc

Benchmarks using Fortran, C, and C++:

icpc icc ifort

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

519.lbm\_r: basepeak = yes

538.imagick\_r: basepeak = yes

544.nab\_r: basepeak = yes

C++ benchmarks:

508.namd\_r: basepeak = yes

510.parest\_r: basepeak = yes

Fortran benchmarks:

503.bwaves\_r: -m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -O3 -ipo

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## Peak Optimization Flags (Continued)

503.bwaves\_r (continued):

```
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

549.fotonik3d\_r: basepeak = yes

554.roms\_r: basepeak = yes

Benchmarks using both Fortran and C:

```
521.wrf_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

527.cam4\_r: basepeak = yes

Benchmarks using both C and C++:

```
511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

526.blender\_r: basepeak = yes

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/HPE-Platform-Flags-Intel-V1.3-CLX-revC.html>

[http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64\\_revA.html](http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.html)

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.3-CLX-revC.xml>

[http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64\\_revA.xml](http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.xml)



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