



# SPEC CPU®2017 Floating Point Rate Result

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## Nettrix

SPECrate®2017\_fp\_base = 960

R620 G50 LP (Intel Xeon Platinum 8490H, 1.90 GHz)

SPECrate®2017\_fp\_peak = 1020

CPU2017 License: 6138

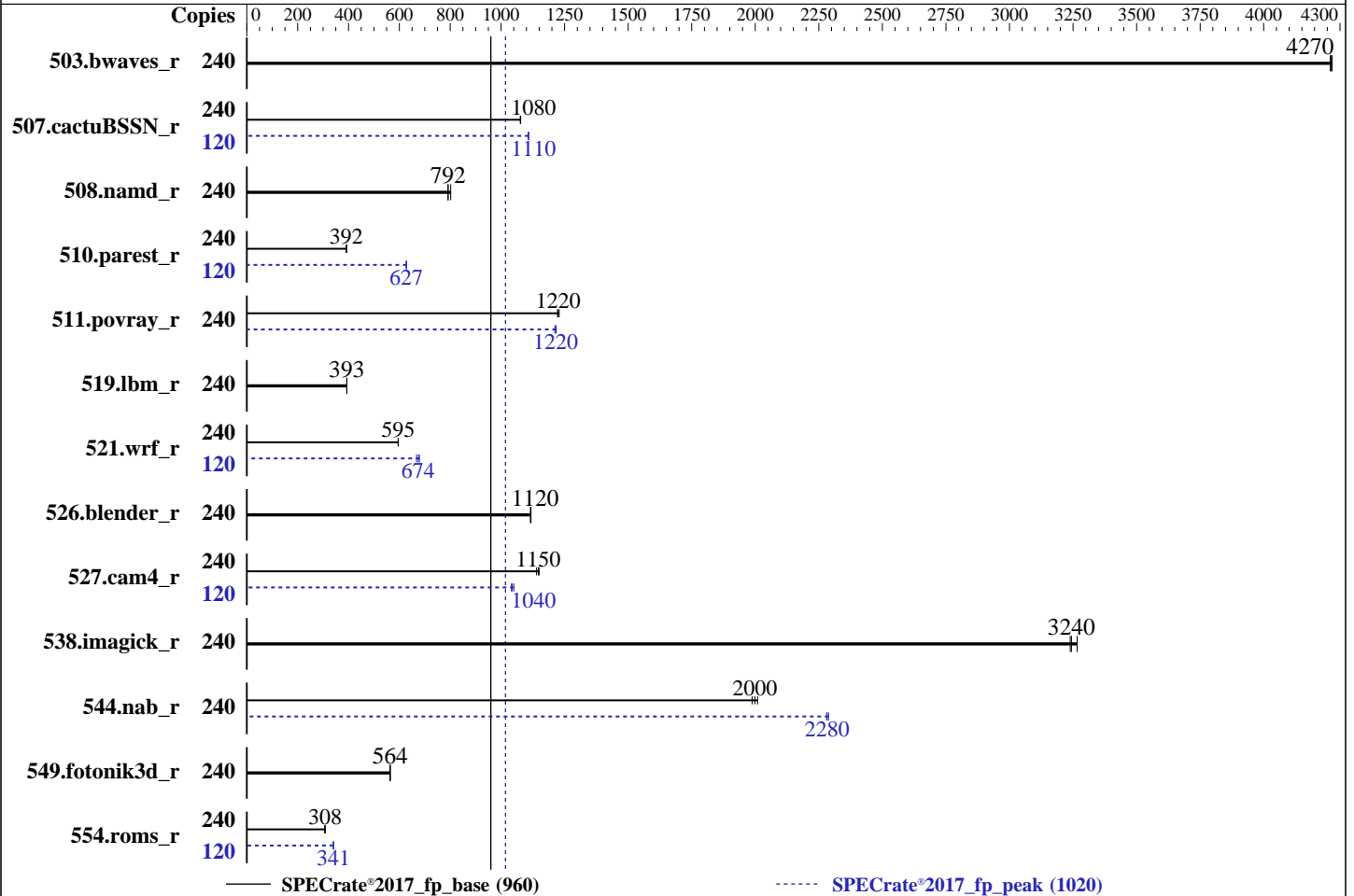
Test Sponsor: Nettrix

Tested by: Nettrix

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: Nov-2022



### Hardware

CPU Name: Intel Xeon Platinum 8490H  
 Max MHz: 3500  
 Nominal: 1900  
 Enabled: 120 cores, 2 chips, 2 threads/core  
 Orderable: 1,2 chips  
 Cache L1: 32 KB I + 48 KB D on chip per core  
 L2: 2 MB I+D on chip per core  
 L3: 112.5 MB I+D on chip per chip  
 Other: None  
 Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 1 x 960 GB NVME SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP3  
 5.3.18-150300.59.101-default  
 Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++  
 Compiler Build 20220316 for Linux;  
 Fortran: Version 2022.1 of Intel Fortran Compiler  
 Build 20220316 for Linux;  
 Parallel: No  
 Firmware: Nettrix BIOS Version NNH1041018-U00-1 released  
 Nov-2022  
 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 and OS 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    | 240    | 565         | 4260        | <b>564</b> | <b>4270</b> | 564        | 4270        | 240    | 565         | 4260        | <b>564</b> | <b>4270</b> | 564        | 4270        |
| 507.cactuBSSN_r | 240    | <b>282</b>  | <b>1080</b> | 282        | 1080        | 282        | 1080        | 120    | <b>137</b>  | <b>1110</b> | 137        | 1110        | 137        | 1110        |
| 508.namd_r      | 240    | <b>288</b>  | <b>792</b>  | 284        | 802         | 288        | 792         | 240    | <b>288</b>  | <b>792</b>  | 284        | 802         | 288        | 792         |
| 510.parest_r    | 240    | <b>1604</b> | <b>392</b>  | 1605       | 391         | 1599       | 393         | 120    | 499         | 629         | <b>500</b> | <b>627</b>  | 501        | 627         |
| 511.povray_r    | 240    | <b>458</b>  | <b>1220</b> | 459        | 1220        | 456        | 1230        | 240    | <b>461</b>  | <b>1220</b> | 462        | 1210        | 461        | 1220        |
| 519.lbm_r       | 240    | <b>643</b>  | <b>393</b>  | 643        | 393         | 643        | 394         | 240    | <b>643</b>  | <b>393</b>  | 643        | 393         | 643        | 394         |
| 521.wrf_r       | 240    | 903         | 595         | 903        | 596         | <b>903</b> | <b>595</b>  | 120    | 396         | 679         | 403        | 667         | <b>399</b> | <b>674</b>  |
| 526.blender_r   | 240    | 327         | 1120        | 328        | 1120        | <b>327</b> | <b>1120</b> | 240    | 327         | 1120        | 328        | 1120        | <b>327</b> | <b>1120</b> |
| 527.cam4_r      | 240    | 365         | 1150        | <b>366</b> | <b>1150</b> | 368        | 1140        | 120    | 202         | 1040        | 200        | 1050        | <b>201</b> | <b>1040</b> |
| 538.imagick_r   | 240    | 184         | 3240        | <b>184</b> | <b>3240</b> | 183        | 3270        | 240    | 184         | 3240        | <b>184</b> | <b>3240</b> | 183        | 3270        |
| 544.nab_r       | 240    | 201         | 2010        | 203        | 1990        | <b>202</b> | <b>2000</b> | 240    | 177         | 2280        | 177        | 2290        | <b>177</b> | <b>2280</b> |
| 549.fotonik3d_r | 240    | <b>1659</b> | <b>564</b>  | 1659       | 564         | 1659       | 564         | 240    | <b>1659</b> | <b>564</b>  | 1659       | 564         | 1659       | 564         |
| 554.roms_r      | 240    | <b>1240</b> | <b>308</b>  | 1243       | 307         | 1239       | 308         | 120    | 560         | 340         | <b>560</b> | <b>341</b>  | 560        | 341         |

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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"

## Environment Variables Notes

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

## General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4  
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)

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### General Notes (Continued)

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.  
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>  
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:

Enable LP [Global] set to ALL LPs  
LLC Prefetch set to Disabled  
SNC (Sub NUMA) set to Enable SNC4 (4-clusters)  
Patrol Scrub set to Disabled  
LLC dead line alloc set to Disabled  
XPT Prefetch set to Enabled  
KTI Prefetch set to Disabled  
DCU Streamer Prefetcher set to Disabled  
Hardware P-States set to Native Mode

Sysinfo program /home/lijq/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d  
running on localhost Sun Dec 18 15:14:12 2022

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 8490H
  2 "physical id"s (chips)
  240 "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 : 60
siblings  : 120
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
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
```

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### Platform Notes (Continued)

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

From lscpu from util-linux 2.36.2:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
Address sizes:         52 bits physical, 57 bits virtual
CPU(s):                240
On-line CPU(s) list:   0-239
Thread(s) per core:    2
Core(s) per socket:    60
Socket(s):             2
NUMA node(s):         8
Vendor ID:             GenuineIntel
CPU family:            6
Model:                143
Model name:            Intel(R) Xeon(R) Platinum 8490H
Stepping:              8
CPU MHz:               2900.078
CPU max MHz:           3500.0000
CPU min MHz:           800.0000
BogoMIPS:              3800.00
Virtualization:        VT-x
L1d cache:             5.6 MiB
L1i cache:             3.8 MiB
L2 cache:              240 MiB
L3 cache:              225 MiB
NUMA node0 CPU(s):    0-14,120-134
NUMA node1 CPU(s):    15-29,135-149
NUMA node2 CPU(s):    30-44,150-164
NUMA node3 CPU(s):    45-59,165-179
NUMA node4 CPU(s):    60-74,180-194
NUMA node5 CPU(s):    75-89,195-209
NUMA node6 CPU(s):    90-104,210-224
NUMA node7 CPU(s):    105-119,225-239
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:    Not affected
Vulnerability Mds:     Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB

```

(Continued on next page)



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### Platform Notes (Continued)

filling, PBR SB-eIBRS SW sequence  
 Vulnerability Srbds: Not affected  
 Vulnerability Tsx async abort: Not affected  
 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 aperfmperf tsc\_known\_freq pni pclmulqdq dtes64 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 cat\_l2 cdp\_l3 invpcid\_single cdp\_l2 ssbd mba ibrs ibpb stibp ibrs\_enhanced tpr\_shadow vnmi flexpriority ept vpid ept\_ad fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt\_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel\_pt avx512cd sha\_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local split\_lock\_detect avx512\_bf16 wbnoinvd dtherm ida arat pln pts hwp hwp\_act\_window hwp\_epp hwp\_pkg\_req avx512vbmi umip pku ospke waitpkg avx512\_vbmi2 gfni vaes vpclmulqdq avx512\_vnni avx512\_bitalg tme avx512\_vpopcntdq la57 rdpid cldemote movdiri movdir64b enqcmd fsrm md\_clear serialize tsxldtrk pconfig avx512\_fp16 flush\_lld arch\_capabilities

From lscpu --cache:

| NAME | ONE-SIZE | ALL-SIZE | WAYS | TYPE        | LEVEL | SETS   | PHY-LINE | COHERENCY-SIZE |
|------|----------|----------|------|-------------|-------|--------|----------|----------------|
| L1d  | 48K      | 5.6M     | 12   | Data        | 1     | 64     | 1        | 64             |
| L1i  | 32K      | 3.8M     | 8    | Instruction | 1     | 64     | 1        | 64             |
| L2   | 2M       | 240M     | 16   | Unified     | 2     | 2048   | 1        | 64             |
| L3   | 112.5M   | 225M     | 15   | Unified     | 3     | 122880 | 1        | 64             |

/proc/cpuinfo cache data  
cache size : 115200 KB

From numactl --hardware

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

available: 8 nodes (0-7)  
 node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134  
 node 0 size: 128537 MB  
 node 0 free: 128066 MB  
 node 1 cpus: 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149  
 node 1 size: 129016 MB  
 node 1 free: 128787 MB  
 node 2 cpus: 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164  
 node 2 size: 129016 MB  
 node 2 free: 128664 MB  
 node 3 cpus: 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179

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### Platform Notes (Continued)

```

node 3 size: 128979 MB
node 3 free: 128738 MB
node 4 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 180 181 182 183 184 185 186
187 188 189 190 191 192 193 194
node 4 size: 129016 MB
node 4 free: 128772 MB
node 5 cpus: 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 195 196 197 198 199 200 201
202 203 204 205 206 207 208 209
node 5 size: 129016 MB
node 5 free: 128716 MB
node 6 cpus: 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 210 211 212 213 214 215
216 217 218 219 220 221 222 223 224
node 6 size: 129016 MB
node 6 free: 128718 MB
node 7 cpus: 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 225 226 227
228 229 230 231 232 233 234 235 236 237 238 239
node 7 size: 128754 MB
node 7 free: 128473 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10  12  12  12  21  21  21  21
1:  12  10  12  12  21  21  21  21
2:  12  12  10  12  21  21  21  21
3:  12  12  12  10  21  21  21  21
4:  21  21  21  21  10  12  12  12
5:  21  21  21  21  12  10  12  12
6:  21  21  21  21  12  12  10  12
7:  21  21  21  21  12  12  12  10

```

```

From /proc/meminfo
MemTotal:      1056108440 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
performance

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP3"
VERSION_ID="15.3"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp3"

```

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### Platform Notes (Continued)

uname -a:

```
Linux localhost 5.3.18-150300.59.101-default #1 SMP Tue Nov 1 11:32:03 UTC 2022
(b2a976e) 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  |
| mmio_stale_data:                                       | Not affected  |
| retbleed:  | 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/swapgs barriers and __user pointer sanitization                |
| CVE-2017-5715 (Spectre variant 2):                     | Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling, PBRSE-eIBRS: SW sequence |
| CVE-2020-0543 (Special Register Buffer Data Sampling): | Not affected  |
| CVE-2019-11135 (TSX Asynchronous Abort):               | Not affected  |

run-level 3 Dec 18 14:47

SPEC is set to: /home/lijq

| Filesystem     | Type | Size | Used | Avail | Use% | Mounted on |
|----------------|------|------|------|-------|------|------------|
| /dev/nvme0n1p3 | xfs  | 854G | 129G | 726G  | 16%  | /home      |

```
From /sys/devices/virtual/dmi/id
Vendor: Nettrix
Product: R620 G50 LP
Product Family: Rack
Serial: 6101823603509646
```

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:  
16x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800

```
BIOS:
  BIOS Vendor: American Megatrends International, LLC.
  BIOS Version: NNH1041018-U00-1
```

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### Platform Notes (Continued)

BIOS Date: 11/01/2022  
BIOS Revision: 5.29

(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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
-----

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
-----

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
-----

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version  
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### Compiler Version Notes (Continued)

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

### Base Compiler Invocation

C benchmarks:  
icx

C++ benchmarks:  
icpx

Fortran benchmarks:  
ifx

Benchmarks using both Fortran and C:  
ifx icx

Benchmarks using both C and C++:  
icpx icx

Benchmarks using Fortran, C, and C++:  
icpx icx ifx



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## 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:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

### C++ benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

### Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

### Benchmarks using both Fortran and C:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

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

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

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# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Nettrix

SPECrate®2017\_fp\_base = 960

R620 G50 LP (Intel Xeon Platinum 8490H, 1.90 GHz)

SPECrate®2017\_fp\_peak = 1020

CPU2017 License: 6138  
Test Sponsor: Nettrix  
Tested by: Nettrix

Test Date: Dec-2022  
Hardware Availability: Jan-2023  
Software Availability: Nov-2022

## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

## Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

## 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: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
```

(Continued on next page)



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**Software Availability:** Nov-2022

## Peak Optimization Flags (Continued)

544.nab\_r (continued):

```
-qopt-mem-layout-trans=4 -qopt-zmm-usage=high -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:

508.namd\_r: basepeak = yes

```
510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:

503.bwaves\_r: basepeak = yes

549.fotonik3d\_r: basepeak = yes

```
554.roms_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs  
-align array32byte -auto -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both Fortran and C:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:

```
511.povray_r: -w -m64 -std=c11 -Wl,-z,muldefs  
-fprofile-generate(pass 1)  
-fprofile-use=default.profddata(pass 2) -xCORE-AVX512  
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

526.blender\_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
```

(Continued on next page)



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Hardware Availability: Jan-2023

Software Availability: Nov-2022

## Peak Optimization Flags (Continued)

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

-L/usr/local/jemalloc64-5.0.1/lib

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

<http://www.spec.org/cpu2017/flags/Nettrix-Platform-Settings-V1.3-SPR-revA.html>

[http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64\\_revA.html](http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.html)

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

<http://www.spec.org/cpu2017/flags/Nettrix-Platform-Settings-V1.3-SPR-revA.xml>

[http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64\\_revA.xml](http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.xml)

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Tested with SPEC CPU®2017 v1.1.8 on 2022-12-18 02:14:11-0500.

Report generated on 2023-01-10 19:02:22 by CPU2017 PDF formatter v6442.

Originally published on 2023-01-10.