



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 843

PowerEdge MX760c (Intel Xeon Platinum 8468V)

SPECrate®2017_fp_peak = 899

CPU2017 License: 6573

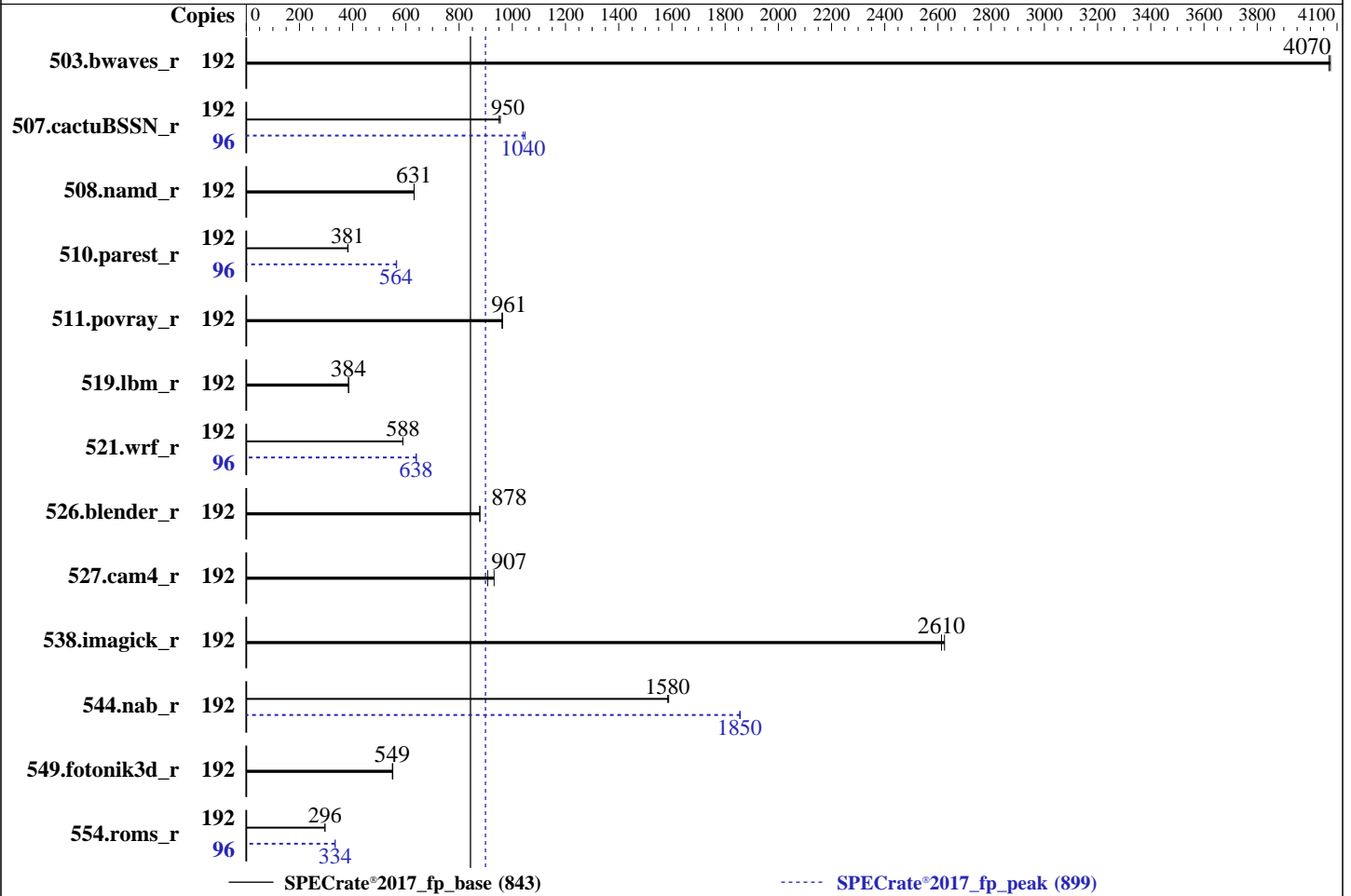
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2022

Hardware Availability: Feb-2023

Software Availability: Nov-2022



Hardware

CPU Name: Intel Xeon Platinum 8468V
 Max MHz: 3800
 Nominal: 2400
 Enabled: 96 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: 97.5 MB I+D on chip per chip
 Other: None
 Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
 Storage: 125 GB on tmpfs
 Other: None

Software

OS: Red Hat Enterprise Linux 8.7 (Ootpa)
 4.18.0-425.3.1.el8.x86_64
 Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;
 Parallel: No
 Firmware: Version 0.3.2 released Nov-2022
 File System: tmpfs
 System State: Run level 5 (graphical 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	192	473	4070	472	4080			192	473	4070	472	4080		
507.cactuBSSN_r	192	256	950	255	955			96	117	1040	116	1050		
508.namd_r	192	289	631	289	631			192	289	631	289	631		
510.parest_r	192	1312	383	1318	381			96	444	565	445	564		
511.povray_r	192	467	961	465	963			192	467	961	465	963		
519.lbm_r	192	527	384	526	384			192	527	384	526	384		
521.wrf_r	192	730	589	731	588			96	337	638	336	640		
526.blender_r	192	333	878	333	878			192	333	878	333	878		
527.cam4_r	192	361	931	370	907			192	361	931	370	907		
538.imagick_r	192	183	2610	182	2620			192	183	2610	182	2620		
544.nab_r	192	204	1590	204	1580			192	174	1850	174	1860		
549.fotonik3d_r	192	1363	549	1359	551			192	1363	549	1359	551		
554.roms_r	192	1032	296	1031	296			96	457	334	457	334		

SPECrate®2017_fp_base = **843**

SPECrate®2017_fp_peak = **899**

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 =
"/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/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
Transparent Huge Pages enabled by default

(Continued on next page)



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General Notes (Continued)

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>

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.

Benchmark run from a 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

Platform Notes

BIOS settings:
 ADDDC Setting : Disabled
 DIMM Self Healing on
 Uncorrectable Memory Error : Disabled
 Virtualization Technology : Disabled
 Sub NUMA Cluster : 4-way Clustering
 DCU Streamer Prefetcher : Disabled
 LLC Prefetch : Disabled
 Dead Line LLC Alloc : Disabled
 Optimizer Mode : Enabled

 System Profile : Custom
 CPU Power Management : Maximum Performance
 C1E : Disabled
 C States : Autonomous
 Memory Patrol Scrub : Disabled
 Energy Efficiency Policy : Performance
 PCI ASPM L1 Link
 Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-ic2022.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Tue Dec 13 08:09:49 2022

SUT (System Under Test) info as seen by some common utilities.

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Platform Notes (Continued)

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 8468V
 2 "physical id"s (chips)
192 "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      : 48
siblings       : 96
physical 0:    cores 0 1 2 3 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
physical 1:    cores 0 1 2 3 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
```

From lscpu from util-linux 2.32.1:

```
Architecture:    x86_64
CPU op-mode(s):  32-bit, 64-bit
Byte Order:      Little Endian
CPU(s):          192
On-line CPU(s) list: 0-191
Thread(s) per core: 2
Core(s) per socket: 48
Socket(s):       2
NUMA node(s):   8
Vendor ID:      GenuineIntel
BIOS Vendor ID: Intel
CPU family:     6
Model:         143
Model name:     Intel(R) Xeon(R) Platinum 8468V
BIOS Model name: Intel(R) Xeon(R) Platinum 8468V
Stepping:      8
CPU MHz:       2400.000
BogoMIPS:      4800.00
L1d cache:     48K
L1i cache:     32K
L2 cache:      2048K
L3 cache:      99840K
NUMA node0 CPU(s):
0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 96, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140
NUMA node1 CPU(s):
48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 144, 148, 152, 156, 160, 164, 168, 172, 176, 180, 184, 188
NUMA node2 CPU(s):
2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 98, 102, 106, 110, 114, 118, 122, 126, 130, 134, 138, 142
NUMA node3 CPU(s):
50, 54, 58, 62, 66, 70, 74, 78, 82, 86, 90, 94, 146, 150, 154, 158, 162, 166, 170, 174, 178, 182, 186, 190
```

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Platform Notes (Continued)

NUMA node4 CPU(s):
 1,5,9,13,17,21,25,29,33,37,41,45,97,101,105,109,113,117,121,125,129,133,137,141
 NUMA node5 CPU(s):
 49,53,57,61,65,69,73,77,81,85,89,93,145,149,153,157,161,165,169,173,177,181,185,189
 NUMA node6 CPU(s):
 3,7,11,15,19,23,27,31,35,39,43,47,99,103,107,111,115,119,123,127,131,135,139,143
 NUMA node7 CPU(s):
 51,55,59,63,67,71,75,79,83,87,91,95,147,151,155,159,163,167,171,175,179,183,187,191
 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 monitor ds_cpl 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 fsgsbase tsc_adjust
 bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
 avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt
 xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
 split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts hfi
 avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
 avx512_bitalg tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri
 movdir64b enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr amx_bf16
 avx512_fp16 amx_tile amx_int8 flush_lld arch_capabilities

```
/proc/cpuinfo cache data
cache size : 99840 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 4 8 12 16 20 24 28 32 36 40 44 96 100 104 108 112 116 120 124 128 132
136 140
node 0 size: 128215 MB
node 0 free: 113919 MB
node 1 cpus: 48 52 56 60 64 68 72 76 80 84 88 92 144 148 152 156 160 164 168 172 176
180 184 188
node 1 size: 129018 MB
node 1 free: 119885 MB
node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 98 102 106 110 114 118 122 126 130 134
138 142
node 2 size: 129018 MB
node 2 free: 111611 MB
node 3 cpus: 50 54 58 62 66 70 74 78 82 86 90 94 146 150 154 158 162 166 170 174 178
182 186 190
node 3 size: 129018 MB
node 3 free: 119924 MB
node 4 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 97 101 105 109 113 117 121 125 129 133
```

(Continued on next page)



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Platform Notes (Continued)

```

137 141
node 4 size: 129018 MB
node 4 free: 119926 MB
node 5 cpus: 49 53 57 61 65 69 73 77 81 85 89 93 145 149 153 157 161 165 169 173 177
181 185 189
node 5 size: 129018 MB
node 5 free: 119977 MB
node 6 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 99 103 107 111 115 119 123 127 131 135
139 143
node 6 size: 128976 MB
node 6 free: 119873 MB
node 7 cpus: 51 55 59 63 67 71 75 79 83 87 91 95 147 151 155 159 163 167 171 175 179
183 187 191
node 7 size: 129006 MB
node 7 free: 119980 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:      1056043120 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/sbin/tuned-adm active
Current active profile: throughput-performance

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.7 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.7"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.7 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.7 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.7 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos

```

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Platform Notes (Continued)

```
uname -a:
Linux localhost.localdomain 4.18.0-425.3.1.el8.x86_64 #1 SMP Fri Sep 30 11:45:06 EDT
2022 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
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 5 Dec 13 03:31
```

```
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-ic2022.1
Filesystem      Type  Size  Used Avail Use% Mounted on
tmpfs            tmpfs 125G   77G   49G  61% /mnt/ramdisk
```

```
From /sys/devices/virtual/dmi/id
Vendor:          Dell Inc.
Product:         PowerEdge MX760c
Product Family:  PowerEdge
Serial:          MWCFG04
```

Additional information from dmidecode 3.3 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 002C0632002C MTC40F2046S1RC48BA1 64 GB 2 rank 4800

```
BIOS:
BIOS Vendor:     Dell Inc.
BIOS Version:    0.3.2
BIOS Date:       11/30/2022
```

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Platform Notes (Continued)

BIOS Revision: 0.3

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

=====
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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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)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 843

PowerEdge MX760c (Intel Xeon Platinum 8468V)

SPECrate®2017_fp_peak = 899

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2022

Hardware Availability: Feb-2023

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:

```
521.wrf_r: -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
```

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: basepeak = yes

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



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

<http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64-revB.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.2.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64-revB.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.2.xml>

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