



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

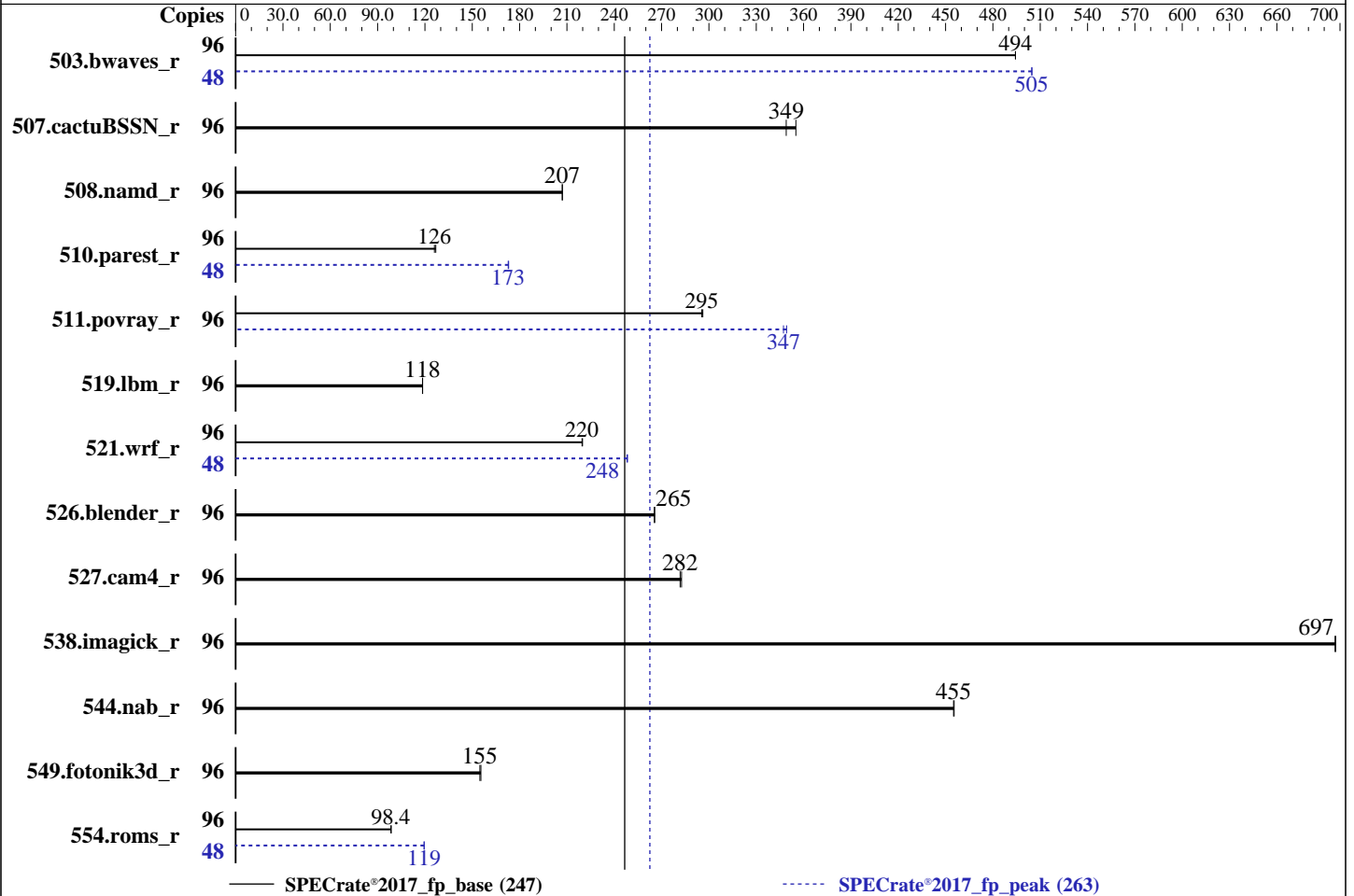
Test Date: Jul-2020

Test Sponsor: Dell Inc.

Hardware Availability: Jul-2020

Tested by: Dell Inc.

Software Availability: Apr-2020



Hardware

CPU Name: Intel Xeon Gold 5220R
 Max MHz: 4000
 Nominal: 2200
 Enabled: 48 cores, 2 chips, 2 threads/core
 Orderable: 1,2 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 35.75 MB I+D on chip per chip
 Other: None
 Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R, running at 2666)
 Storage: 1 x 1.92 TB SATA SSD
 Other: None

Software

OS: Red Hat Enterprise Linux 8.1
 kernel 4.18.0-147.el8.x86_64
 Compiler: C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux;
 Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux
 Parallel: No
 Firmware: Version 2.7.7 released May-2020
 File System: tmpfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: jemalloc memory allocator V5.0.1
 Power Management: BIOS set to prefer performance at the cost of additional power usage.



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	96	<u>1948</u>	<u>494</u>	1947	494			48	<u>954</u>	<u>505</u>	954	505		
507.cactuBSSN_r	96	342	355	<u>348</u>	<u>349</u>			96	342	355	<u>348</u>	<u>349</u>		
508.namd_r	96	440	207	<u>441</u>	<u>207</u>			96	440	207	<u>441</u>	<u>207</u>		
510.parest_r	96	<u>1993</u>	<u>126</u>	1979	127			48	<u>727</u>	<u>173</u>	726	173		
511.povray_r	96	757	296	<u>759</u>	<u>295</u>			96	642	349	<u>646</u>	<u>347</u>		
519.lbm_r	96	854	119	<u>854</u>	<u>118</u>			96	854	119	<u>854</u>	<u>118</u>		
521.wrf_r	96	<u>979</u>	<u>220</u>	978	220			48	433	248	<u>433</u>	<u>248</u>		
526.blender_r	96	<u>551</u>	<u>265</u>	550	266			96	<u>551</u>	<u>265</u>	550	266		
527.cam4_r	96	<u>596</u>	<u>282</u>	594	283			96	<u>596</u>	<u>282</u>	594	283		
538.imagick_r	96	342	697	<u>343</u>	<u>697</u>			96	342	697	<u>343</u>	<u>697</u>		
544.nab_r	96	<u>355</u>	<u>455</u>	355	455			96	<u>355</u>	<u>455</u>	355	455		
549.fotonik3d_r	96	2406	155	<u>2416</u>	<u>155</u>			96	2406	155	<u>2416</u>	<u>155</u>		
554.roms_r	96	1547	98.6	<u>1550</u>	<u>98.4</u>			48	638	120	<u>638</u>	<u>119</u>		

SPECrate®2017_fp_base = 247

SPECrate®2017_fp_peak = 263

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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-ic19.lul/lib/intel64:/mnt/ramdisk/cpu2017-ic19.lul/je5.0.1-64"
MALLOC_CONF = "retain:true"



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

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.

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>
```

Benchmark run from a 225 GB ramdisk created with the cmd: "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk"

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 settings:

- Sub NUMA Cluster enabled
- Virtualization Technology disabled
- System Profile set to Custom
- CPU Performance set to Maximum Performance
- C States set to Autonomous
- C1E disabled
- Uncore Frequency set to Dynamic
- Energy Efficiency Policy set to Performance
- Memory Patrol Scrub set to standard
- Logical Processor enabled
- CPU Interconnect Bus Link Power Management disabled
- PCI ASPM L1 Link Power Management disabled
- UPI Prefetch enabled
- LLC Prefetch disabled
- Dead Line LLC Alloc enabled
- Directory AtoS disabled

Sysinfo program /mnt/ramdisk/cpu2017-ic19.1ul1/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
 running on user-pc.spa.lab Fri Jul 3 10:47:53 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>

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Platform Notes (Continued)

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Gold 5220R CPU @ 2.20GHz

2 "physical id"s (chips)

96 "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 : 24

siblings : 48

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

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

From lscpu:

Architecture: x86_64

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

Byte Order: Little Endian

CPU(s): 96

On-line CPU(s) list: 0-95

Thread(s) per core: 2

Core(s) per socket: 24

Socket(s): 2

NUMA node(s): 4

Vendor ID: GenuineIntel

CPU family: 6

Model: 85

Model name: Intel(R) Xeon(R) Gold 5220R CPU @ 2.20GHz

Stepping: 7

CPU MHz: 2927.386

CPU max MHz: 4000.0000

CPU min MHz: 1000.0000

BogoMIPS: 4400.00

Virtualization: VT-x

L1d cache: 32K

L1i cache: 32K

L2 cache: 1024K

L3 cache: 36608K

NUMA node0 CPU(s):

0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92

NUMA node1 CPU(s):

1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93

NUMA node2 CPU(s):

2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94

NUMA node3 CPU(s):

3,7,11,15,19,23,27,31,35,39,43,47,51,55,59,63,67,71,75,79,83,87,91,95

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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Platform Notes (Continued)

```

aperfmpperf 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 fl6c 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 dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d
arch_capabilities

```

```

/proc/cpuinfo cache data
cache size : 36608 KB

```

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

```

available: 4 nodes (0-3)
node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92
node 0 size: 192071 MB
node 0 free: 191612 MB
node 1 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93
node 1 size: 193531 MB
node 1 free: 184267 MB
node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74 78 82 86 90 94
node 2 size: 193531 MB
node 2 free: 193154 MB
node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79 83 87 91 95
node 3 size: 193505 MB
node 3 free: 192701 MB
node distances:
node  0  1  2  3
 0:  10  21  11  21
 1:  21  10  21  11
 2:  11  21  10  21
 3:  21  11  21  10

```

```

From /proc/meminfo
MemTotal:      791182284 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.1 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.1"

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Platform Notes (Continued)

```
PLATFORM_ID="platform:el8"
```

```
PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
```

```
ANSI_COLOR="0;31"
```

```
redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
```

```
system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
```

```
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga
```

```
uname -a:
```

```
Linux user-pc.spa.lab 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019 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: usercopy/swaps barriers and __user pointer sanitization

CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

```
run-level 3 Jul 3 04:41 last=5
```

SPEC is set to: /mnt/ramdisk/cpu2017-ic19.1ul

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
tmpfs	tmpfs	225G	4.3G	221G	2%	/mnt/ramdisk

From /sys/devices/virtual/dmi/id

BIOS: Dell Inc. 2.7.7 05/04/2020

Vendor: Dell Inc.

Product: PowerEdge R740xd

Product Family: PowerEdge

Serial: F5BMCS2

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:

19x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933

1x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933

4x 00AD069D00AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933

(End of data from sysinfo program)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

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
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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Compiler Version Notes (Continued)

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

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)
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.

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

SPECrate®2017_fp_peak = 263

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Compiler Version Notes (Continued)

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

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Base Compiler Invocation (Continued)

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
```

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
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-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
```

Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Peak Compiler Invocation (Continued)

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: -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:

503.bwaves_r: -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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

Peak Optimization Flags (Continued)

503.bwaves_r (continued):

```
-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: Same as 503.bwaves_r

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/Intel-ic19.1ul-official-linux64_revA.html

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE11.html>

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

http://www.spec.org/cpu2017/flags/Intel-ic19.1ul-official-linux64_revA.xml

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE11.xml>



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 247

PowerEdge R740xd (Intel Xeon Gold 5220R, 2.20 GHz)

SPECrate®2017_fp_peak = 263

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jul-2020

Hardware Availability: Jul-2020

Software Availability: Apr-2020

SPEC CPU and SPECrate are 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.

Tested with SPEC CPU®2017 v1.1.0 on 2020-07-03 11:47:52-0400.

Report generated on 2020-07-21 13:25:59 by CPU2017 PDF formatter v6255.

Originally published on 2020-07-21.