Dell Inc.
PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz)

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

Threads

603.bwaves_s 48
607.cactuBSSN_s 48
619.lbm_s 48
621.wrf_s 48
627.cam4_s 48
628.pop2_s 48
638.imagick_s 48
644.nab_s 48
649.fotonik3d_s 48
654.roms_s 48

SPECspeed2017_fp_base = 143
SPECspeed2017_fp_peak = 145

Hardware
CPU Name: Intel Xeon Platinum 8260
Max MHz.: 3900
Nominal: 2400
Enabled: 48 cores, 2 chips
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: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software
OS: Ubuntu 18.04.2 LTS
Compiler: C/C++: Version 19.0.1.144 of Intel C/C++
Compiler Build 20181018 for Linux;
Fortran: Version 19.0.1.144 of Intel Fortran
Compiler Build 20181018 for Linux
Parallel: Yes
Firmware: Version 2.1.6 released Mar-2019
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
SPEC CPU2017 Floating Point Speed Result

Dell Inc.
PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz)  
SPECspeed2017_fp_base = 143  
SPECspeed2017_fp_peak = 145

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test Date: Mar-2019  
Hardware Availability: Apr-2019  
Software Availability: Feb-2019

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</table>

SPECspeed2017_fp_base = 143  
SPECspeed2017_fp_peak = 145

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

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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

Platform Notes

BIOS settings:
ADDDC setting disabled
Sub NUMA Cluster disabled

(Continued on next page)
Dell Inc.
PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz)

SPEC CPU2017 Floating Point Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_fp_base = 143
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Mar-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Platform Notes (Continued)

Virtualization Technology disabled
DCU Streamer Prefetcher 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 disabled
Logical Processor disabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on intel-sut Sun Mar 24 18:47:58 2019

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Platinum 8260 CPU @ 2.40GHz
  2 "physical id"s (chips)
  48 "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 : 24
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu:

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8260 CPU @ 2.40GHz
Stepping: 6
CPU MHz: 3302.136

(Continued on next page)
Platform Notes (Continued)

BogoMIPS: 4800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s):
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46
NUMA node1 CPU(s):
1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47
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 pni pclmulqdq dtets64 monitor ds cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand
lahf_lm abm 3dnowprefetch cpuid_fault epb cat l3 cdp l3 invpcid_single ssbd mba ibrs
ibpb stibp ibrs enhanced tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust
bmi1 hle avx2 smep bmi2 ets invpcid rtm cqm mpx rtm rdt_a avx512f avx512dq rdseed adx
smap clflushopt cwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1
xsavec cmp liking cmp_occurs cmp_mbb_total cmp_mbb_local dtherm ida arat pln pts pku
ospke avx512_vnni 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: 2 nodes (0-1)
  node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46
  node 0 size: 191913 MB
  node 0 free: 189401 MB
  node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
  node 1 size: 193530 MB
  node 1 free: 188023 MB
  node distances:
  node  0   1
  0:  10  21
  1:  21  10

  From /proc/meminfo
    MemTotal: 394695096 KB
    HugePages_Total: 0
    Hugepagesize: 2048 KB

  /usr/bin/lsb_release -d
    Ubuntu 18.04.2 LTS

(Continued on next page)
Dell Inc.  
PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz)  

**SPEC CPU2017 Floating Point Speed Result**

**SPECspeed2017_fp_base = 143**  
**SPECspeed2017_fp_peak = 145**

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** Mar-2019  
**Hardware Availability:** Apr-2019  
**Tested by:** Dell Inc.  
**Software Availability:** Feb-2019

Platform Notes (Continued)

```plaintext
From /etc/*release* /etc/*version*  
debian_version: buster/sid  
os-release:  
    NAME="Ubuntu"  
    VERSION="18.04.2 LTS (Bionic Beaver)"  
    ID=ubuntu  
    ID_LIKE=debian  
    PRETTY_NAME="Ubuntu 18.04.2 LTS"  
    VERSION_ID="18.04"  
    HOME_URL="https://www.ubuntu.com/"  
    SUPPORT_URL="https://help.ubuntu.com/"
```

```plaintext
uname -a:  
    Linux intel-sut 4.15.0-45-generic #48-Ubuntu SMP Tue Jan 29 16:28:13 UTC 2019 x86_64  
x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- CVE-2017-5754 (Meltdown): Not affected  
- CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization  
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB

```plaintext
run-level 5 Mar 24 14:06
```

**SPEC is set to:** /home/cpu2017  
**Filesystem** | **Type** | **Size** | **Used** | **Avail** | **Use%** | **Mounted on**  
--- | --- | --- | --- | --- | --- | ---  
/dev/sda2 | ext4 | 439G | 25G | 392G | 6% | /

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.  
**BIOS** Dell Inc. 2.1.6 03/03/2019  
**Memory:**  
    12x 00AD069D00AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933  
    12x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

```
==============================================================================
CC  619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.1.144 Build 20181018
```

(Continued on next page)
# Dell Inc.

PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz) | SPEC CPU2017 Floating Point Speed Result

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**SPECspeed2017_fp_base** = 143

**SPECspeed2017_fp_peak** = 145

**Test Date:** Mar-2019

**Hardware Availability:** Apr-2019

**Software Availability:** Feb-2019

## Compiler Version Notes (Continued)

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**FC 607.cactuBSSN_s(base, peak)**

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018

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---

**FC 603.bwaves_s(base)** 649.fotonik3d_s(base) 654.roms_s(base, peak)**

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018

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**FC 603.bwaves_s(peak)** 649.fotonik3d_s(peak)**

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018

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---

**CC 621.wrf_s(base)** 627.cam4_s(base, peak) 628.pop2_s(base)**

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018

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---

**CC 621.wrf_s(peak)** 628.pop2_s(peak)**

(Continued on next page)
Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

603.bwaves.s: -DSPEC_LP64
607.cactuBSSN.s: -DSPEC_LP64
619.lbm.s: -DSPEC_LP64
621.wrf.s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4.s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2.s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian -assume byterecl
638.imagick.s: -DSPEC_LP64
644.nab.s: -DSPEC_LP64
649.fotonik3d.s: -DSPEC_LP64
654.roms.s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

(Continued on next page)
Dell Inc.
PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz) | SPECspeed2017_fp_base = 143
| SPECspeed2017_fp_peak = 145

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### Base Optimization Flags (Continued)

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

### Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

C benchmarks:

(Continued on next page)
**SPEC CPU2017 Floating Point Speed Result**

### Dell Inc.

**PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz)**

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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Mar-2019

**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

---

**Peak Optimization Flags (Continued)**

- **619.lbm_s:**
  `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`  
  `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
  `-DSPEC_OPENMP`

- **638.imagick_s:** Same as 619.lbm_s

- **644.nab_s:** `basepeak = yes`

**Fortran benchmarks:**

- **603.bwaves_s:**
  `-prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP`  
  `-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3`  
  `-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4`  
  `-qopenmp -nostandard-realloc-lhs`

- **649.fotonik3d_s:**
  `basepeak = yes`

- **654.roms_s:**
  `-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div`  
  `-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4`  
  `-qopenmp -nostandard-realloc-lhs`

**Benchmarks using both Fortran and C:**

- **621.wrf_s:**
  `-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512`  
  `-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div`  
  `-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp`  
  `-DSPEC_OPENMP -nostandard-realloc-lhs`

- **627.cam4_s:**
  `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`  
  `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
  `-DSPEC_OPENMP -nostandard-realloc-lhs`

- **628.pop2_s:** Same as 621.wrf_s

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

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`  
  `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`  
  `-nostandard-realloc-lhs`

---

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


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

## SPEC CPU2017 Floating Point Speed Result

**Dell Inc.**  
PowerEdge R740xd (Intel Xeon Platinum 8260, 2.40GHz)  

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-03-24 14:47:58-0400.  
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