Dell Inc.
PowerEdge R340 (Intel Xeon E-2124)

SPECrate2017_fp_base = 29.6
SPECrate2017_fp_peak = 28.6

Copyright 2017-2019 Standard Performance Evaluation Corporation

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.
Test Date: Mar-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

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<td>22.9</td>
<td>27.9</td>
</tr>
<tr>
<td>554.roms_r 4</td>
<td>15.4</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Hardware:
CPU Name: Intel Xeon E-2124
Max MHz.: 4300
Nominal: 3300
Enabled: 4 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 256 KB I+D on chip per core
L3: 8 MB I+D on chip per chip
Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software:
OS: SUSE Linux Enterprise Server 12 SP3 4.4.126-94.22-default
Compiler: C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux;
Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux
Parallel: No
Firmware: Version 1.0.1 released Oct-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Results Table

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<td>15.8</td>
</tr>
</tbody>
</table>

SPECrate2017_fp_base = 29.6
SPECrate2017_fp_peak = 28.6

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"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

Yes: 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
**SPEC CPU2017 Floating Point Rate Result**  
Copyright 2017-2019 Standard Performance Evaluation Corporation

**Dell Inc.**  
**PowerEdge R340 (Intel Xeon E-2124)**  

| SPECrate2017_fp_base | 29.6 |
| SPECrate2017_fp_peak | 28.6 |

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** Mar-2019  
**Tested by:** Dell Inc.  
**Hardware Availability:** Dec-2018  
**Software Availability:** Apr-2018

---

**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 numacl i.e.:  
numactl --interleave=all runcpu <etc>

---

**Platform Notes**

BIOS settings:  
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 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 9bcde8f2999c33d61f64985e45859ea9  
running on linux-bx7m Tue Mar 12 13:23:26 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) E-2124 CPU @ 3.30GHz  
1 "physical id"s (chips)  
4 "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 : 4  
siblings : 4  
physical 0: cores 0 1 2 3

From lsCPU:  
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 4  
On-line CPU(s) list: 0-3  
Thread(s) per core: 1  
Core(s) per socket: 4  
Socket(s): 1

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Dell Inc.
PowerEdge R340 (Intel Xeon E-2124)

<table>
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.
Test Date: Mar-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

Platform Notes (Continued)

NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz
Stepping: 10
CPU MHz: 4208.051
CPU max MHz: 4300.000
CPU min MHz: 800.0000
BogoMIPS: 6623.99
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-3

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 aperf perfctr eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epccmp boycmp popcnt tsc_deadline_timer aes

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 1 nodes (0)
node 0 cpus: 0 1 2 3
node 0 size: 64278 MB
node 0 free: 63818 MB
node distances:
node 0
0: 10

From /proc/meminfo
MemTotal: 65820840 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP3

(Continued on next page)
Dell Inc.

PowerEdge R340 (Intel Xeon E-2124)

SPEC CPU2017 Floating Point Rate Result

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SPECrate2017_fp_base = 29.6
SPECrate2017_fp_peak = 28.6

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

Platform Notes (Continued)

From /etc/*release* /etc/*version*
SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 3
    # This file is deprecated and will be removed in a future service pack or release.
    # Please check /etc/os-release for details about this release.
os-release:
    NAME="SLES"
    VERSION="12-SP3"
    VERSION_ID="12.3"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
    Linux linux-bx7m 4.4.126-94.22-default #1 SMP Wed Apr 11 07:45:03 UTC 2018 (9649989)
    x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Mar 12 08:57 last=5

SPEC is set to: /home/cpu2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/sda2 xfs 300G 17G 284G 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. 1.0.1 10/19/2018
    Memory:
        3x 00AD00000A02 HMA82GU7CJR8N-VK 16 GB 2 rank 2666
        1x 00AD00000A07 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

(End of data from sysinfo program)
Dell Inc. PowerEdge R340 (Intel Xeon E-2124)

**Benchmark Results**

- **SPECrate2017_fp_base** = 29.6
- **SPECrate2017_fp_peak** = 28.6

**Tests Details**
- CPU2017 License: 55
- Test Sponsor: Dell Inc.
- Tested by: Dell Inc.
- Test Date: Mar-2019
- Hardware Availability: Dec-2018
- Software Availability: Apr-2018

---

**Compiler Version Notes**

```plaintext
==============================================================================
  CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
  icc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
  CC  519.lbm_r(peak) 538.imagick_r(peak) 544.nab_r(peak)
  icc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
  CXXC 508.namd_r(base) 510.parest_r(base)
  icpc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
  CXXC 508.namd_r(peak) 510.parest_r(peak)
  icpc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
  CC  511.povray_r(base) 526.blender_r(base)
  icpc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
  icc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
  CC  511.povray_r(peak) 526.blender_r(peak)
  icpc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
  icc (ICC) 18.0.2 20180210
  Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
```

(Continued on next page)
Dell Inc.
PowerEdge R340 (Intel Xeon E-2124)

SPECraten2017_fp_peak = 28.6
SPECraten2017_fp_base = 29.6

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

Test Date: Mar-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

Compiler Version Notes (Continued)

FC 507.cactuBSSN_r(base)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 507.cactuBSSN_r(peak)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 503.bwaves_r(peak) 549.fotonik3d_r(peak) 554.roms_r(peak)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC 521.wrf_r(base) 527.cam4_r(base)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC 521.wrf_r(peak) 527.cam4_r(peak)

(Continued on next page)
### Dell Inc.

**PowerEdge R340 (Intel Xeon E-2124)**

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#### Compiler Version Notes (Continued)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

### Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

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

Benchmarks using both C and C++:
```
icpc -m64 icc -m64 -std=c11
```

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

### 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
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Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
Dell Inc. PowerEdge R340 (Intel Xeon E-2124)  

**SPECrate2017_fp_base = 29.6**  
**SPECrate2017_fp_peak = 28.6**

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Mar-2019</th>
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</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Dec-2018</td>
</tr>
<tr>
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<td>Software Availability: Apr-2018</td>
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</tbody>
</table>

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

#### C benchmarks:
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo -xCORE-AVX2 -O3`  
- `-qopt-mem-layout-trans=3`  
- `-no-prec-div`  
- `-qopt-prefetch -ffinite-math-only`

#### C++ benchmarks:
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo -xCORE-AVX2 -O3`  
- `-no-prec-div`  
- `-qopt-prefetch -ffinite-math-only`  
- `-qopt-mem-layout-trans=3`  
- `-auto -nostandard-realloc-lhs`

#### Fortran benchmarks:
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo -xCORE-AVX2 -O3`  
- `-no-prec-div`  
- `-qopt-prefetch -ffinite-math-only`  
- `-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs`

#### Benchmarks using both Fortran and C:
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo -xCORE-AVX2 -O3`  
- `-no-prec-div`  
- `-qopt-prefetch -ffinite-math-only`  
- `-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs`

#### Benchmarks using both C and C++:
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo -xCORE-AVX2 -O3`  
- `-no-prec-div`  
- `-qopt-prefetch -ffinite-math-only`  
- `-qopt-mem-layout-trans=3`

#### Benchmarks using Fortran, C, and C++:
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo -xCORE-AVX2 -O3`  
- `-no-prec-div`  
- `-qopt-prefetch -ffinite-math-only`  
- `-qopt-mem-layout-trans=3 -auto -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:

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