## Dell Inc.

### PowerEdge R240 (Intel Celeron G4900)

### SPECrate2017_fp_base = 11.6

### SPECrate2017_fp_peak = 11.7

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</table>

### CPU2017 License: 55

### Test Sponsor: Dell Inc.

### Tested by: Dell Inc.

### Hardware

- **CPU Name:** Intel Celeron G4900
- **Max MHz.:** 3100
- **Nominal:** 3100
- **Enabled:** 2 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:** 2 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
- **Storage:** 1 x 960 GB SATA SSD
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP3
- **Kernel:** 4.4.126-94.22-default
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++; Compiler for Linux; Fortran: Version 18.0.0.128 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

### Test Data:

- **Test Date:** Mar-2019
- **Hardware Availability:** Dec-2018
- **Software Availability:** Oct-2018
**SPEC CPU2017 Floating Point Rate Result**

**Dell Inc.**

**PowerEdge R240 (Intel Celeron G4900)**

**SPECrate2017_fp_base = 11.6**

**SPECrate2017_fp_peak = 11.7**

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

**Results Table**

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</table>

**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"

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
Prior to runcpu invocation

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

**Dell Inc.**

**PowerEdge R240 (Intel Celeron G4900)**

<table>
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<tr>
<th>SPECrate2017_fp_base</th>
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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:** Oct-2018

**General Notes (Continued)**

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>
```

**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-gw0u Tue Mar 26 15:07:32 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) Celeron(R) G4900 CPU @ 3.10GHz
  1  "physical id"s (chips)
  2  "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 : 2
  siblings : 2
  physical 0: cores 0 1
```

From lscpu:
```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 2
On-line CPU(s) list: 0,1
Thread(s) per core: 1
Core(s) per socket: 2
Socket(s): 1
NUMA node(s): 1
```

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

**PowerEdge R240 (Intel Celeron G4900)**

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**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Hardware Availability:** Dec-2018

**Test Date:** Mar-2019

**Tested by:** Dell Inc.

**Software Availability:** Oct-2018

### Platform Notes (Continued)

Vendor ID: **GenuineIntel**

CPU family: 6

Model: 158

Model name: Intel(R) Celeron(R) G4900 CPU @ 3.10GHz

Stepping: 11

CPU MHz: 3100.005

CPU max MHz: 3100.0000

CPU min MHz: 800.0000

BogoMIPS: 6191.99

Virtualization: VT-x

L1d cache: 32K

L1i cache: 32K

L2 cache: 256K

L3 cache: 2048K

NUMA node0 CPU(s): 0,1

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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmprefl eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg x2apic movbe popcnt tsc_deadline_timer aes xsave rdRand lahf_lm abm 3dnowprefetch arat ept p4invpd pme.stringify pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg x2apic movbe popcnt tsc_deadline_timer aes xsave rdRand lahf_lm abm 3dnowprefetch arat ept p4invpd pme.stringify

```
/proc/cpuinfo cache data
  cache size : 2048 KB

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
  node 0 size: 64278 MB
  node 0 free: 63812 MB
  node distances:
    node 0
      0: 10

From /proc/meminfo
  MemTotal: 65821136 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

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

From /etc/*release* /etc/*version*
```

(Continued on next page)
Dell Inc.
PowerEdge R240 (Intel Celeron G4900)

SPECrate2017_fp_base = 11.6
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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: Oct-2018

Platform Notes (Continued)

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-gw0u 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 26 09:02 last=5

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   301G   17G  285G   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, configured at 2400
   1x 00AD00000A06 HMA82GU7CJR8N-VK 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base) |
(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Dell Inc.
PowerEdge R240 (Intel Celeron G4900)

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

Compiler Version Notes (Continued)

=================================================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=================================================================================================
CC 519.lbm_r(peak) 544.nab_r(peak)
icc (ICC) 18.0.0 20170811
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=================================================================================================
CXXC 508.namd_r(base) 510.parest_r(base)
icpc (ICC) 18.0.0 20170811
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=================================================================================================
FC 507.cactuBSSN_r(base)

(Continued on next page)
### Dell Inc. PowerEdge R240 (Intel Celeron G4900)

**SPEC CPU2017 Floating Point Rate Result**

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**Compiler Version Notes (Continued)**

- **icpc (ICC) 18.0.0 20170811**
- Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

- **icc (ICC) 18.0.0 20170811**
- Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

- **ifort (IFORT) 18.0.0 20170811**
- Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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**FC 507.cactuBSSN_r(peak)**

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**FC 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)**

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**FC 554.roms_r(peak)**

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

---

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

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

icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

------------------------------------------------------------------

### Base Compiler Invocation

C benchmarks:  
icc

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

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
Dell Inc.  
PowerEdge R240 (Intel Celeron G4900)  

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</table>

**Spec CPU2017 Floating Point Rate Result**

**Base Optimization Flags**

C benchmarks:
- `-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3`

C++ benchmarks:
- `-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3`

Fortran benchmarks:
- `-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

Benchmarks using both Fortran and C:
- `-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

Benchmarks using both C and C++:
- `-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3`

Benchmarks using Fortran, C, and C++:
- `-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

**Base Other Flags**

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

C++ benchmarks:
- `-m64`

Fortran benchmarks:
- `-m64`

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

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

Benchmarks using Fortran, C, and C++:
- `-m64 -std=c11`
### Peak Compiler Invocation

- **C benchmarks:**
  - icc

- **C++ benchmarks:**
  - icpc

- **Fortran benchmarks:**
  - ifort

- **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: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

  538.imagick_r: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

  544.nab_r: Same as 519.lbm_r

- **C++ benchmarks:**
  
  -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

- **Fortran benchmarks:**
Dell Inc.
PowerEdge R240 (Intel Celeron G4900)

**SPEC CPU2017 Floating Point Rate Result**

**SPECrate2017_fp_base** = 11.6
**SPECrate2017_fp_peak** = 11.7

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

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

---

**Peak Optimization Flags (Continued)**

503.bwaves_r: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3
-nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3
-nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -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 -xSSE4.2 -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3
-nostandard-realloc-lhs -align array32byte

---

**Peak Other Flags**

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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

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

Benchmarks using Fortran, C, and C++:
-m64 -std=c11
Dell Inc.  
PowerEdge R240 (Intel Celeron G4900)  

**SPECrate2017_fp_base = 11.6**  
**SPECrate2017_fp_peak = 11.7**

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<th>CPU2017 License</th>
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<th>Tested by</th>
<th>Test Date</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
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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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