## SPEC® CPU2017 Integer Rate Result

**Dell Inc.**

**PowerEdge R340 (Intel Celeron G4900)**

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
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<tr>
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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

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<td>13.0</td>
<td></td>
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### 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  
**Cache L2:** 256 KB I+D on chip per core  
**Cache L3:** 2 MB I+D on chip per chip  
**Other:** None  
**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:** 32/64-bit  
**Other:** jemalloc: jemalloc memory allocator library V5.0.1;
Dell Inc.

PowerEdge R340 (Intel Celeron G4900)

SPECrate2017_int_base = 8.52

SPECrate2017_int_peak = 9.09

Results Table

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<tr>
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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
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>

(Continued on next page)
### General Notes (Continued)

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;  
jemalloc: sources available via jemalloc.net

### 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 9bcd0f2999c33d61f64985e45859ea9  
running on linux-bx7m Tue Mar 26 09:05:40 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

From /proc/cpuinfo

```plaintext
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:

```plaintext
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
Vendor ID: GenuineIntel
```

(Continued on next page)
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CPU family: 6
Model: 158
Model name: Intel(R) Celeron(R) G4900 CPU @ 3.10GHz
Stepping: 11
CPU MHz: 3015.889
CPU max MHz: 3100.0000
CPU min MHz: 800.0000
BogoMIPS: 6192.00
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 aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg x2apic movbe popcnt tsc_deadline_timer aes xsave xsaves rdrand lahf_lm abm 3dnowprefetch arat invpclcd_single pln pts dtherm hwp hwp_act_window hwp_epp intel_pt rsb ctrxs xsaveopt xsavec xgetbv1

/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*
SuSE-release:

(Continued on next page)
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| Test Sponsor: | Dell Inc. |
| Tested by: | Dell Inc. |

| Test Date: | Mar-2019 |
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**Platform Notes (Continued)**

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.

```plaintext
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"
```

```plaintext
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 26 09:05 last=5

SPEC is set to: /home/cpu2017

```plaintext
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 SM BIOS" standard.

```plaintext
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  500.perlbench_r(base)  502.gcc_r(base)  505.mcf_r(base, peak)  525.x264_r(base, peak)  557.xz_r(base, peak)
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Compiler Version Notes (Continued)

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

==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
  541.leela_r(base)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
  541.leela_r(peak)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  548.exchange2_r(base, peak)
==============================================================================
ifort (IFORT) 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
Dell Inc.
PowerEdge R340 (Intel Celeron G4900)

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Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
- Wl,-z,muldefs -xsx4.2 -ipo -O3 -no-prec-div -qopt-prefetch
- qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
- Wl,-z,muldefs -xsx4.2 -ipo -O3 -no-prec-div -qopt-prefetch
- qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
- Wl,-z,muldefs -xsx4.2 -ipo -O3 -no-prec-div -qopt-prefetch
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
- L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
- m64 -std=c11

C++ benchmarks:
- m64

Fortran benchmarks:
- m64
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**Peak Compiler Invocation**

- **C benchmarks:** icc
- **C++ benchmarks:** icpc
- **Fortran benchmarks:** ifort

---

**Peak Portability Flags**

- 500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
- 502.gcc_r: -D_FILE_OFFSET_BITS=64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
- 525.x264_r: -DSPEC_LP64
- 531.deepsjeng_r: -DSPEC_LP64
- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

---

**Peak Optimization Flags**

- **C benchmarks:**
  - 500.perlbench_r: -W1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc
  - 520.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -W1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xSSE4.2 -O3 -no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc
  - 505.mcf_r: -W1,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

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**Peak Optimization Flags (Continued)**

525.x264_r: -Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div
-qopt-prefetch -qopt-mem-layout-trans=3 -fno-alias
-L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xSSE4.2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib
-ljemalloc

523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xSSE4.2 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib
-ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

-Wl,-z,muldefs -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

---

**Peak Other Flags**

C benchmarks (except as noted below):

-m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):

-m64

523.xalancbmk_r: -m32

Fortran benchmarks:

-m64
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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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