### SPEC® CPU2017 Integer Rate Result

**Dell Inc.**  
**PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)**

<table>
<thead>
<tr>
<th>SPECrate2017_int_peak</th>
<th>84.4</th>
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<tbody>
<tr>
<td>SPECrate2017_int_base</td>
<td>81.6</td>
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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

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**SPECrate2017_int_base (81.6)**  
**SPECrate2017_int_peak (84.4)**

### Hardware

- **CPU Name:** Intel Xeon Silver 4208  
- **Max MHz.:** 3200  
- **Nominal:** 2100  
- **Enabled:** 16 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:** 11 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx8 PC4-2933Y-R, running at 2400)  
- **Storage:** 1 x 480 GB SATA SSD  
- **Other:** None

### Software

- **OS:** Ubuntu 18.04.2 LTS  
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++  
- **Parallel:** No  
- **Firmware:** Version 2.2.2 released Mar-2019  
- **System State:** Run level 5 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator V5.0.1
Dell Inc.  
PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)

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SPECrate2017_int_base = 81.6  
SPECrate2017_int_peak = 84.4

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 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
runcpu command invoked through numactl i.e.:
umactl --interleave=all runcpu <etc>

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

**PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)**

| SPECrate2017_int_base | 81.6 |
| SPECrate2017_int_peak | 84.4 |

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

**General Notes (Continued)**

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  

---

**Platform Notes**

BIOS settings:  
ADDDC setting disabled  
Sub NUMA Cluster enabled  
Virtualization Technology disabled  
DCU Streamer Prefetcher enabled  
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 enabled  
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 intel-sut Tue Apr 2 15:15:36 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) Silver 4208 CPU @ 2.10GHz
  2 "physical id"s (chips)
  32 "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 : 8
  siblings : 16
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7
```

From lscpu:

```
Architecture:       x86_64
CPU op-mode(s):    32-bit, 64-bit
Byte Order:        Little Endian
CPU(s):            32
On-line CPU(s) list: 0-31
```

(Continued on next page)
Dell Inc. PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 81.6
SPECrate2017_int_peak = 84.4

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.
Test Date: Mar-2019
Hardware Availability: Apr-2019
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Platform Notes (Continued)

Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4208 CPU @ 2.10GHz
Stepping: 6
CPU MHz: 2496.103
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31
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 dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbog 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 vmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpecid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clshflpt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

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
node 0 size: 192877 MB
node 0 free: 192449 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
node 1 size: 193511 MB
node 1 free: 192785 MB
node distances:
node 0 1
0: 10 21
1: 21 10

(Continued on next page)
# SPEC CPU2017 Integer Rate Result

**Dell Inc.**

PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)

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## Platform Notes (Continued)

From `/proc/meminfo`
```
MemTotal:       395662252 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

/usr/bin/lsb_release -d
```
Ubuntu 18.04.2 LTS
```

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/"
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
```

run-level 5 Apr 1 23:39

SPEC is set to: /home/cpu2017
```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      ext4  439G  19G  398G  5% /
```

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. 2.2.2 03/05/2019
Memory:
3x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400
9x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400
4x Not Specified Not Specified
```

(End of data from sysinfo program)
**Dell Inc.**

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**Compiler Version Notes**

```plaintext
==============================================================================
CC   502.gcc_r(peak)
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version
19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
525.x264_r(base, peak) 557.xz_r(base, peak)
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.

==============================================================================
CC   500.perlbench_r(peak)
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.

==============================================================================
CXXC 523.xalancbmk_r(peak)
Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version
19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base,
peak) 541.leela_r(base, peak)
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.

==============================================================================
FC  548.exchange2_r(base, peak)
Intel(R) Fortran 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 FC640 (Intel Xeon Silver 4208, 2.10GHz)  

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

Compiler Version Notes (Continued)

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

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:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc

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

Base Optimization Flags (Continued)

Fortran benchmarks:
- W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
- L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
- lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11

502.gcc_r icc -m32 -std=c11 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m64

523.xalancbmk_r icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcfr: -DSPEC_LP64
520.ommnetpp_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
- xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4

(Continued on next page)
Dell Inc.

PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)

**SPECrate2017_int_base = 81.6**

**SPECrate2017_int_peak = 84.4**

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Mar-2019</th>
</tr>
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<td>Hardware Availability: Apr-2019</td>
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</tr>
</tbody>
</table>

**Peak Optimization Flags (Continued)**

500.perlbench_r (continued):
- -fno-strict-overflow
- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\r\k\b\k\l\m\a\1\l\6\4\1\l\6\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

505.mcf_r: -Wl,-z,muldefs -xcORE-AXX512 -ip0 -ipo -no-prec-div
- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

525.x264_r: -Wl,-z,muldefs -xcORE-AXX512 -ip0 -ipo -no-prec-div
- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -xcORE-AXX512 -ip0 -ipo -no-prec-div
- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

- d:\us\r\l\l\k\c\y\n\s\l\r\c\p\l\a\m\n\d\l\1\l\6\4\1\l\6\d\l\k\m\a\l\l\|

The flags files that were used to format this result can be browsed at
### SPEC CPU2017 Integer Rate Result

**Dell Inc.**

PowerEdge FC640 (Intel Xeon Silver 4208, 2.10GHz)

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


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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 2019-04-02 11:15:35-0400.

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