**Dell Inc.**  
PowerEdge R740xd2 (Intel Xeon Silver 4110, 2.10GHz)  

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Nov-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Dec-2018</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Apr-2018</td>
</tr>
</tbody>
</table>

### SPECrate2017_int_result

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Dell Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

#### CPU2017 License:
55

#### Test Date:
Nov-2018

#### Hardware

**CPU Name:** Intel Xeon Silver 4110  
**Max MHz.:** 3000  
**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:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
**Storage:** 1 x 250 GB M.2 SATA SSD  
**Other:** None

#### Software

**OS:** SUSE Linux Enterprise Server 12 SP3  
**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 1.0.2 released Oct-2018  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** jemalloc memory allocator v5.0.1

### Benchmarks

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_r</td>
<td>32</td>
<td>54.7</td>
<td>Not Run</td>
</tr>
<tr>
<td>gcc_r</td>
<td>32</td>
<td>62.2</td>
<td></td>
</tr>
<tr>
<td>mcf_r</td>
<td>32</td>
<td>43.8</td>
<td></td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>32</td>
<td>74.5</td>
<td></td>
</tr>
<tr>
<td>xalancbmk_r</td>
<td>32</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>x264_r</td>
<td>32</td>
<td>62.2</td>
<td></td>
</tr>
<tr>
<td>deepsjeng_r</td>
<td>32</td>
<td>61.4</td>
<td></td>
</tr>
<tr>
<td>leela_r</td>
<td>32</td>
<td>56.4</td>
<td></td>
</tr>
<tr>
<td>exchange2_r</td>
<td>32</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td>xz_r</td>
<td>32</td>
<td>48.3</td>
<td></td>
</tr>
</tbody>
</table>
SPEC CPU2017 Integer Rate Result

Dell Inc.
PowerEdge R740xd2 (Intel Xeon Silver 4110, 2.10GHz)

SPECrate2017_int_base = 70.2
SPECrate2017_int_peak = Not Run

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>923</td>
<td>55.2</td>
<td>931</td>
<td>54.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>728</td>
<td>62.2</td>
<td>729</td>
<td>62.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>596</td>
<td>86.7</td>
<td>589</td>
<td>87.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>958</td>
<td>43.8</td>
<td>952</td>
<td>44.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>451</td>
<td>74.9</td>
<td>454</td>
<td>74.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>420</td>
<td>133</td>
<td>409</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>597</td>
<td>61.4</td>
<td>597</td>
<td>61.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>932</td>
<td>56.8</td>
<td>939</td>
<td>56.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>623</td>
<td>135</td>
<td>622</td>
<td>135</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>716</td>
<td>48.3</td>
<td>715</td>
<td>48.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 70.2
SPECrate2017_int_peak = Not Run

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
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.:

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Dell Inc.
PowerEdge R740xd2 (Intel Xeon Silver 4110, 2.10GHz)

SPECrate2017_int_base = 70.2
SPECrate2017_int_peak = Not Run

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

Test Date: Nov-2018
Hardware Availability: Dec-2018
Software Availability: Apr-2018

General Notes (Continued)
numactl --interleave=all runcpu <etc>
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5

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
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 9bcd8f2999c33d61f64985e45859ea9
running on linux-m8ku Fri Nov 2 12:56:15 2018

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 4110 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
Thread(s) per core: 2
Core(s) per socket: 8

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

### Dell Inc.

**PowerEdge R740xd2 (Intel Xeon Silver 4110, 2.10GHz)**

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

**SPECrate2017_int_base = 70.2**

**SPECrate2017_int_peak = Not Run**

| Socket(s): | 2 |
| NUMA node(s): | 2 |
| Vendor ID: | GenuineIntel |
| CPU family: | 6 |
| Model: | 85 |
| Model name: | Intel(R) Xeon(R) Silver 4110 CPU @ 2.10GHz |
| Stepping: | 4 |
| CPU MHz: | 2095.078 |
| BogoMIPS: | 4190.15 |
| 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 aperf nonstop_tsc aperfperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrunc pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts dtherm intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vmx flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3dnow invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsave xgetbv1 cqm_llc cqm_occip_llc pku ospke |

From numactl --hardware data

| NUMA distances: | node 0 1 |

| 0: | 10 21 |
| 1: | 21 10 |

From /proc/meminfo

| MemTotal: | 196642468 KB |
| HugePages_Total: | 0 |

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Dell Inc.  
PowerEdge R740xd2 (Intel Xeon Silver 4110, 2.10GHz)

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>SPECrate2017_int_base = 70.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>SPECrate2017_int_peak = Not Run</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Test Date: Nov-2018</td>
</tr>
<tr>
<td>Hardware Availability: Dec-2018</td>
<td>Software Availability: Apr-2018</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

Hugepagesize: 2048 kB

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

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-m8ku 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
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: Barriers
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Nov 2 12:51 last=5

SPEC is set to: /home/cpu2017

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdab4 xfs 182G 4.0G 178G 3% /home
```

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. 1.0.2 10/19/2018
Memory:
12x 002C04B3002C 18ASF2G72PD2-2G6E1 16 GB 2 rank 2666, configured at 2400
4x Not Specified Not Specified

(End of data from sysinfo program)
# SPEC CPU2017 Integer Rate Result

**Dell Inc.**  
PowerEdge R740xd2 (Intel Xeon Silver 4110, 2.10GHz)  

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>70.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

## Compiler Version Notes

```plaintext
Base Compiler Invocation

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

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

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

## Base Portability Flags

```plaintext
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```

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

### Dell Inc.

**PowerEdge R740xd2** (Intel Xeon Silver 4110, 2.10GHz)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>70.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

### Base Portability Flags (Continued)

- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

**C++ benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

**Fortran benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

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:


### Notes

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2018-11-02 13:56:14-0400.  
Originally published on 2018-11-27.