Dell Inc.  
PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)  

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon E-2146G</td>
<td>OS: SUSE Linux Enterprise Server 12 SP3</td>
</tr>
<tr>
<td>Max MHz.: 4500</td>
<td>kernel 4.4.126-94.22-default</td>
</tr>
<tr>
<td>Nominal: 3500</td>
<td>Compiler: C/C++: Version 18.0.2.20180210 of Intel C/C++</td>
</tr>
<tr>
<td>Enabled: 6 cores, 1 chip, 2 threads/core</td>
<td>Compiler for Linux: Fortran: Version 18.0.2.20180210 of Intel Fortran</td>
</tr>
<tr>
<td>Orderable: 1 chip</td>
<td>Compiler for Linux</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>L2: 256 KB I+D on chip per core</td>
<td>Firmware: Version 1.0.1 released Oct-2018</td>
</tr>
<tr>
<td>L3: 12 MB I+D on chip per chip</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>Other: None</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Storage: 1 x 960 GB SATA SSD</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: jemalloc memory allocator v5.0.1</td>
</tr>
</tbody>
</table>
Dell Inc.

PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)

SPECrate2017_int_base = 39.5
SPECrate2017_int_peak = 41.2

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

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

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>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>12</td>
<td>571</td>
<td>33.4</td>
<td>556</td>
<td>34.4</td>
<td>560</td>
<td>34.1</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>12</td>
<td>478</td>
<td>35.5</td>
<td>479</td>
<td>35.5</td>
<td>481</td>
<td>35.3</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>12</td>
<td>420</td>
<td>46.2</td>
<td>433</td>
<td>44.7</td>
<td>434</td>
<td>44.7</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>12</td>
<td>808</td>
<td>19.5</td>
<td>809</td>
<td>19.5</td>
<td>813</td>
<td>19.4</td>
</tr>
<tr>
<td>523.xalanbmk_r</td>
<td>12</td>
<td>344</td>
<td>36.8</td>
<td>344</td>
<td>36.8</td>
<td>345</td>
<td>36.7</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>12</td>
<td>245</td>
<td>85.8</td>
<td>239</td>
<td>87.8</td>
<td>238</td>
<td>88.2</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>12</td>
<td>352</td>
<td>39.1</td>
<td>359</td>
<td>38.3</td>
<td>360</td>
<td>38.2</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>12</td>
<td>578</td>
<td>34.4</td>
<td>576</td>
<td>34.5</td>
<td>573</td>
<td>34.7</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>12</td>
<td>381</td>
<td>82.6</td>
<td>380</td>
<td>82.7</td>
<td>382</td>
<td>82.4</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>12</td>
<td>514</td>
<td>25.2</td>
<td>517</td>
<td>25.1</td>
<td>515</td>
<td>25.1</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 39.5
SPECrate2017_int_peak = 41.2

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)
Dell Inc.  
PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)  

SPECrate2017_int_base = 39.5  
SPECrate2017_int_peak = 41.2

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 9bcde8f2999c33d61f64985e45859ea9
running on linux-gdas Fri Dec 7 14:26:31 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) E-2146G CPU @ 3.50GHz
  1 "physical id"'s (chips)
  12 "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 : 6
siblings : 12
physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 2
Core(s) per socket: 6
Socket(s): 1

(Continued on next page)
Dell Inc.

PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)

SPECrate2017_int_base = 39.5
SPECrate2017_int_peak = 41.2

<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>Dec-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>

**Platform Notes (Continued)**

```
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2146G CPU @ 3.50GHz
Stepping: 10
CPU MHz: 4166.558
CPU max MHz: 4500.0000
CPU min MHz: 800.0000
BogoMIPS: 7007.98
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-11
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 aperfmpref eagerfpu pni pclmulqdq dtets64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrm pdcnc pcmd 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 hwp hwp_act_window hwp_epp intel_pAPPING nonstop_tsc aunt mpex rdseed adx smap clflushopt xsaveopt xsavec xgetbv1
```

```
/proc/cpuinfo cache data
  cache size : 12288 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 2 3 4 5 6 7 8 9 10 11
  node 0 size: 64276 MB
  node 0 free: 63799 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65818632 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB
```

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

(Continued on next page)
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-gdas 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 Dec 7 14:26 last=5

SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 605G 16G 589G 3% /

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.

BIOS Dell Inc. 1.0.1 10/19/2018
Memory:
  1x 00AD00000A00 HMA82GU7CJR8N-VK 16 GB 2 rank 2666
  3x 00AD00000A02 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

(End of data from sysinfo program)
Dell Inc.
PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)

SPECrates 2017 Int. Rate Result

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

SPECrates 2017 Int. Base = 39.5
SPECrates 2017 Int. Peak = 41.2

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

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
    557.xz_r(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CC  500.perlbench_r(peak) 502.gcc_r(peak) 505.mcf_r(peak) 525.x264_r(peak)
    557.xz_r(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
    541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
    541.leela_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
------------------------------------------------------------------------------
FC  548.exchange2_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
------------------------------------------------------------------------------
FC  548.exchange2_r(peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
SPEC CPU2017 Integer Rate Result

Dell Inc.
PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)  

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.5</td>
<td>41.2</td>
</tr>
</tbody>
</table>

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

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

Base Compiler Invocation

C benchmarks:
i cc -m64 -std=c11

C++ benchmarks:
i cpc -m64

Fortran benchmarks:
i fort -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-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1,-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:
-W1,-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
Dell Inc.
PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)

SPECrate2017_int_base = 39.5
SPECrate2017_int_peak = 41.2

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11
502.gcc_r: icc -m32 -std=c11 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):
icpc -m64
523.xalancbmk_r: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/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.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: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-64/lib -ljemalloc

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

**Dell Inc.**

PowerEdge T140 (Intel Xeon E-2146G, 3.50GHz)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base = 39.5</th>
<th>SPECrate2017_int_peak = 41.2</th>
</tr>
</thead>
</table>

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

**Peak Optimization Flags (Continued)**

525.x264_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -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
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-ipo -L/usr/local/je5.0.1-64/lib -ljemalloc

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-ipo -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 -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2
-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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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 2018-12-07 15:26:31-0500.
Report generated on 2018-12-26 13:02:37 by CPU2017 PDF formatter v6067.
Originally published on 2018-12-25. 