## SPEC® CPU2017 Integer Rate Result

**Dell Inc.**

PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)  

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License</td>
<td>55</td>
</tr>
<tr>
<td>Test Sponsor</td>
<td>Dell Inc.</td>
</tr>
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<td>Tested by</td>
<td>Dell Inc.</td>
</tr>
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<tr>
<td>Software Availability</td>
<td>Apr-2018</td>
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<td>23.9</td>
</tr>
<tr>
<td>SPECrate2017_int_peak</td>
<td>24.5</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E-2124  
  - **Max MHz.:** 4300  
  - **Nominal:** 3300  
  - **Enabled:** 4 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:** 8 MB I+D on chip per core  
  - **Other:** None  
  - **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)  
  - **Storage:** 1 x 960 GB SATA SSD  
  - **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP3  
  - **Version:** 4.4.126-94.22-default  
- **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 1.0.1 released Oct-2018  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator v5.0.1

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### SPEC2017 Benchmark Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Rate (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>24.5</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>23.3</td>
</tr>
<tr>
<td>505.mcf_r</td>
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<tr>
<td>520.omnetpp_r</td>
<td>14.1</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>23.9</td>
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<tr>
<td>525.x264_r</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>21.5</td>
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<tr>
<td>541.leela_r</td>
<td>17.5</td>
</tr>
<tr>
<td>548.exchange2_r</td>
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</tr>
<tr>
<td>557.xz_r</td>
<td>13.9</td>
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</tbody>
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---

### SPEC2017 Results Summary

| SPECrate2017_int_base | 23.9 |
| SPECrate2017_int_peak | 24.5 |
Dell Inc. PowerEdge T340 (Intel Xeon E-2124, 3.30GHz) SPECrate2017_int_base = 23.9 SPECrate2017_int_peak = 24.5

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
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<td>12.4</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 23.9 SPECrate2017_int_peak = 24.5

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)
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
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-icjc Mon Feb 25 09:16:07 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) E-2124 CPU @ 3.30GHz
  1 "physical id"s (chips)
    4 "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 : 4
siblings : 4
physical 0: cores 0 1 2 3

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s): 1
NUMA node(s): 1

(Continued on next page)
Dell Inc. PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)

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

**Test Date:** Feb-2019  
**Hardware Availability:** Dec-2018  
**Software Availability:** Apr-2018

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**Platform Notes (Continued)**

```
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 158
Model name:            Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz
Stepping:              10
CPU MHz:               4251.115
CPU max MHz:           4300.0000
CPU min MHz:           800.0000
BogoMIPS:              6623.98
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              256K
L3 cache:              8192K
NUMA node0 CPU(s):     0-3
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
                       rdtsscp lm constant_tsc arch_perfmon pebs bts rep_good ntopology nonstop_tsc
                       aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
                       fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
                       xsave avx f16c rdrand lahf_lm abml impmovsx vpopcnt vpopcrc tsc_adjust bmi1
                       bmi2 aas vmxest fsgsbase rdseed adx smep bmi2  ersed invpcid rtm mxp rdseed adv smap
                       clflushopt xsaveopt xsavec xgetbv1

/proc/cpuinfo cache data
  cache size : 8192 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
  node 0 size: 64278 MB
  node 0 free: 63750 MB
  node distances:
  node 0
  0: 10

From /proc/meminfo
  MemTotal: 65820840 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)
## 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-icjc 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 Feb 25 09:15 last=5
```

SPEC is set to: /home/cpu2017

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   301G   16G  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
  - 1x 00AD00000A07 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

(End of data from sysinfo program)

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## Compiler Version Notes

```
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
```

(Continued on next page)
Dell Inc.
PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)

**SPEC CPU2017 Integer Rate Result**

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

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

SPECrater2017_int_base = 23.9
SPECrater2017_int_peak = 24.5

Test Date: Feb-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

Compiler Version Notes (Continued)

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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
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## 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-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 T340 (Intel Xeon E-2124, 3.30GHz)

SPECrate2017_int_base = 23.9
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CPU2017 License: 55
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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)
### Dell Inc.

**PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)**

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**CPU2017 License:** 55  
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## 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  
-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  
-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:


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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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