# SPEC® CPU2017 Integer Speed Result

## Dell Inc.

**PowerEdge R240 (Intel Xeon E-2126G)**

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Dell Inc.</th>
<th>Hardware Availability:</th>
<th>Dec-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Software Availability:</td>
<td>Apr-2018</td>
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<td>9.95</td>
<td>SPECspeed2017_int_peak</td>
<td>9.84</td>
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### CPU2017 License: 55

**CPU Name:** Intel Xeon E-2126G

- **Max MHz.:** 4500
- **Nominal:** 3300
- **Enabled:** 6 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:** 12 MB I+D on chip per chip
- **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 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:** Yes
- **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

## Hardware

### Software

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<td>6</td>
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<td>631.deepsjeng_s</td>
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<tr>
<td>641.leela_s</td>
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<tr>
<td>648.exchange2_s</td>
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- **600.perlbench_s:** 6 threads
- **602.gcc_s:** 6 threads
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## Dell Inc.

PowerEdge R240 (Intel Xeon E-2126G)

**SPECspeed2017_int_base = 9.95**

**SPECspeed2017_int_peak = 9.84**

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<th>Benchmark</th>
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<th>Seconds</th>
<th>Base</th>
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</table>

### Results Table

- **SPECspeed2017_int_base = 9.95**
- **SPECspeed2017_int_peak = 9.84**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### 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:
  - KMP_AFFINITY = "granularity=fine,scatter"
  - LD_LIBRARY_PATH = "*/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
  - OMP_STACKSIZE = "192M"

- 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
- jemalloc, a general purpose malloc implementation
- built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5
SPEC CPU2017 Integer Speed Result

Dell Inc. PowerEdge R240 (Intel Xeon E-2126G)

**SPECspeed2017_int_base = 9.95**

**SPECspeed2017_int_peak = 9.84**

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Feb-2019  
**Hardware Availability:** Dec-2018  
**Software Availability:** Apr-2018

**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 9bcde8f2999ec33d61f64985e45859ea9  
runtime on linux-gw0u Fri Feb 1 09:21:17 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-2126G CPU @ 3.30GHz
 1 "physical id"s (chips)
 6 "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 : 6
 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):                6
On-line CPU(s) list:   0-5
Thread(s) per core:    1
Core(s) per socket:    6
Socket(s):             1
NUMA node(s):          1
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 158
Model name:            Intel(R) Xeon(R) E-2126G CPU @ 3.30GHz
Stepping:              10
CPU MHz:               4489.263
CPU max MHz:           4500.0000
CPU min MHz:           800.0000
```

(Continued on next page)
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Platform Notes (Continued)

BogoMIPS: 6623.98
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-5
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
aperf perf 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 abm 3dnowprefetch ida arat epivpcid_single pln pts
dtherm hwp hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl stibp retpoline
kaiser tpr_shadow vnm flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv

/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
    node 0 size: 64276 MB
    node 0 free: 62722 MB
    node distances:
    node 0
    0: 10

From /proc/meminfo
    MemTotal: 65819520 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:
        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"

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#### Platform Notes (Continued)

```
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"
```

```bash
uname -a:
Linux linux-gw0u 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 1 09:21 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)

#### Compiler Version Notes

```
==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
==============================================================================
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

(Continued on next page)
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**Compiler Version Notes (Continued)**

```plaintext
657.xz_s(peak)

icc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak) 641.leela_s(peak)

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 648.exchange2_s(base)

ifort (IFORT) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 648.exchange2_s(peak)

ifort (IFORT) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

**C benchmarks:**

```plaintext
icc -m64 -std=c11
```

**C++ benchmarks:**

```plaintext
icpc -m64
```

**Fortran benchmarks:**

```plaintext
ifort -m64
```
## Base Portability Flags

- 600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
- 602.gcc_s: -DSPEC_LP64
- 605.mcf_s: -DSPEC_LP64
- 620.omnetpp_s: -DSPEC_LP64
- 623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
- 625.x264_s: -DSPEC_LP64
- 631.deepsjeng_s: -DSPEC_LP64
- 641.leela_s: -DSPEC_LP64
- 648.exchange2_s: -DSPEC_LP64
- 657.xz_s: -DSPEC_LP64

## Base Optimization Flags

### C benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-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`

## Peak Compiler Invocation

### C benchmarks:
- `icc -m64 -std=cl1`

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

- 623.xalancbmk_s: `icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin`

### Fortran benchmarks:
- `ifort -m64`
Dell Inc.

PowerEdge R240 (Intel Xeon E-2126G)

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Peak Portability Flags

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602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

(Continued on next page)
Peak Optimization Flags (Continued)

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

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3 -qopenmp
-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

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