## SPEC® CPU2017 Integer Speed Result

**Dell Inc.**

**PowerEdge R340 (Intel Xeon E-2124G)**

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Dell Inc.</th>
<th>Tested by:</th>
<th>Dell Inc.</th>
<th>Test Date:</th>
<th>Apr-2019</th>
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<tr>
<td>CPU2017 License:</td>
<td>55</td>
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<td>Dec-2018</td>
<td>Software Availability:</td>
<td>Apr-2018</td>
</tr>
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</table>

### SPECspeed2017_int_base = 9.61

### SPECspeed2017_int_peak = 9.50

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>8.51</td>
<td>11.8</td>
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<tr>
<td>4</td>
<td>6.64</td>
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<td>14.7</td>
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<td>11.6</td>
<td>15.3</td>
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<td>4</td>
<td>13.8</td>
<td>13.2</td>
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<td>4</td>
<td>5.23</td>
<td>10.7</td>
</tr>
<tr>
<td>4</td>
<td>9.06</td>
<td>9.35</td>
</tr>
</tbody>
</table>

### 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

- **CPU Name:** Intel Xeon E-2124G
- **Max MHz.:** 4500
- **Nominal:** 3400
- **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 chip
- **Other:** None
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)
- **Storage:** 1 x 960 GB SATA SSD
- **Other:** None

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**Computer System Information**

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### Results Table

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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>4</td>
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<td>602.mcf_s</td>
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<td>631.xalancbmk_s</td>
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<td>625.x264_s</td>
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<td>648.exchange2_s</td>
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<td>16.3</td>
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<td>657.xz_s</td>
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<td>683</td>
<td><strong>9.06</strong></td>
<td>682</td>
<td>9.06</td>
<td>683</td>
<td>9.06</td>
<td>661</td>
<td><strong>9.35</strong></td>
</tr>
</tbody>
</table>

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## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

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## 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
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**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  
runtime on linux-bx7m Fri Apr 19 06:53:17 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-2124G CPU @ 3.40GHz
-   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  
- Vendor ID: GenuineIntel  
- CPU family: 6  
- Model: 158  
- Model name:  Intel(R) Xeon(R) E-2124G CPU @ 3.40GHz  
- Stepping: 10  
- CPU MHz: 4272.760  
- CPU max MHz: 4500.0000  
- CPU min MHz: 800.0000

(Continued on next page)
Platform Notes (Continued)

BogoMIPS: 6815.99
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 rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmperf 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 epbb invpcid_single pln pts
dtherm hwp hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl stibp retpoline
kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2  ertz invvecid rtm mpx rdseed adx 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: 62825 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*
  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"

uname -a:
Linux linux-bx7m 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

cal-level 3 Apr 19 06:53 last=5

SPEC is set to: /home/cpu2017
    Filesystem   Type Size Used Avail Use% Mounted on
    /dev/sda2   xfs 300G 17G 284G  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.

================================================================================
CC  600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 625.x264_s(peak)

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Compiler Version Notes (Continued)

657.xz_s(peak)

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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)
841.leela_s(base)

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CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak)
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==============================================================================
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:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64
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### 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=c11

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

#### Fortran benchmarks:
- ifort -m64

- 623.xalancbmk_s: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_201808210/compiler/lib/ia32_lin
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Peak 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: -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

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX2 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_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/je5.0.1-64/lib -ljemalloc

625.x264_s: Same as 602.gcc_s

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

620.omnetpp_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/je5.0.1-64/lib -ljemalloc

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**SPECspeed2017_int_peak** = 9.50

**SPECspeed2017_int_base** = 9.61

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### 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:


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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 2019-04-19 07:53:16-0400.
