### SPEC® CPU2017 Integer Speed Result

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Silver 4109T, 2.00 GHz)

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>6.90</td>
<td>7.10</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Silver 4109T
- **Max MHz.:** 3000
- **Nominal:** 2000
- **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
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
- **Storage:** 1 TB SATA SSD
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.114-94.11-default
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++
- **Fortran:** Version 18.0.0.128 of Intel Fortran
- **Compiler for Linux:**
- **Parallel:** Yes
- **Firmware:** Version 1.3.7 released Feb-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Other:** jemalloc memory allocator library V5.0.1
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4109T, 2.00 GHz)

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

SPECspeed2017_int_base = 6.90
SPECspeed2017_int_peak = 7.10

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<th>Ratio</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>365</td>
<td>4.86</td>
<td>369</td>
<td>4.81</td>
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<td>5.76</td>
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<td>602.gcc_s</td>
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<td>535</td>
<td>7.44</td>
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<td>7.50</td>
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<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>401</td>
<td>6.02</td>
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<td>6.00</td>
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<tr>
<td>641.leela_s</td>
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<td>490</td>
<td>3.48</td>
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<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>271</td>
<td>10.9</td>
<td>270</td>
<td>10.9</td>
<td>270</td>
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<td>10.9</td>
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<td>10.9</td>
<td>270</td>
<td>10.9</td>
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<tr>
<td>657.xz_s</td>
<td>32</td>
<td>378</td>
<td>16.3</td>
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<td>16.4</td>
<td>381</td>
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<td>16.8</td>
<td>366</td>
<td>16.9</td>
<td>366</td>
<td>16.9</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base = 6.90
SPECspeed2017_int_peak = 7.10

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"
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.

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
jemalloc: sources available via jemalloc.net

Transparent Huge Pages enabled by default

Prior to runcpu invocation
Filesystem page cache syncd and cleared with:
sync; echo 3>/proc/sys/vm/drop_caches
**SPEC CPU2017 Integer Speed Result**

### Dell Inc.

**PowerEdge C6420 (Intel Xeon Silver 4109T, 2.00 GHz)**

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<td>7.10</td>
</tr>
</tbody>
</table>

**Platform Notes**

- **BIOS settings:**
  - Sub NUMA Cluster disabled
  - Virtualization Technology disabled
  - System Profile set to Custom
  - CPU Performance set to Maximum Performance
  - C States set to Autonomous
  - C1EE 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 /root/cpu2017/bin/sysinfo
  - Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
  - running on linux-5j67 Thu Mar 1 18:42:29 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 4109T CPU @ 2.00GHz
    - 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
    - Socket(s): 2
    - NUMA node(s): 2
    - Vendor ID: GenuineIntel
    - CPU family: 6
    - Model: 85
    - Model name: Intel(R) Xeon(R) Silver 4109T CPU @ 2.00GHz
    - Stepping: 4

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

**Dell Inc.**  
PowerEdge C6420 (Intel Xeon Silver 4109T, 2.00 GHz)  

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</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

**SPECspeed2017_int_peak = 7.10**

**Platform Notes (Continued)**

- CPU MHz: 1995.407
- BogoMIPS: 3990.81
- 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 rdscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmprefs eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr 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 vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  
- From /proc/cpuinfo cache data
  - cache size : 11264 KB
- From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
  - available: 2 nodes (0-1)
    - node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
    - node 0 size: 95353 MB
    - node 0 free: 94998 MB
    - node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
    - node 1 size: 96748 MB
    - node 1 free: 96387 MB
    - node distances:
      - node 0: 0
      - node 1: 1
- From /proc/meminfo
  - MemTotal: 196713216 kB
  - HugePages_Total: 0
  - Hugepagesize: 2048 kB
- From /etc/*release* /etc/*version*
  - SuSE-release:
    - SUSE Linux Enterprise Server 12 (x86_64)
    - VERSION = 12
    - PATCHLEVEL = 3

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Dell Inc.
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SPECspeed2017_int_base = 6.90
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Mar-2018
Tested by: Dell Inc.
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Platform Notes (Continued)

# 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-5j67 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

run-level 3 Mar 1 18:35

SPEC is set to: /root/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 928G 25G 903G 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 SMBIOS" standard.

BIOS Dell Inc. 1.3.7 02/09/2018
Memory:
12x 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400
4x Not Specified Not Specified

(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,
peak) 657.xz_s(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC   600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811

(Continued on next page)
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Software Availability: Sep-2017

Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

FC  648.exchange2_s(base, peak)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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

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Hardware Availability: Sep-2017
Software Availability: Sep-2017

Base Portability Flags (Continued)

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 -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Peak Compiler Invocation

C benchmarks:
icc

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PowerEdge C6420 (Intel Xeon Silver 4109T, 2.00 GHz)

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</table>

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

### Peak Compiler Invocation (Continued)

**C++ benchmarks:**
- icpc

**Fortran benchmarks:**
- ifort

### Peak Portability Flags

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<tr>
<td>620.omnetpp_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>-D_FILE_OFFSET_BITS=64 -DSPEC_LINUX</td>
</tr>
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<td>625.x264_s</td>
<td>-DSPEC_LP64</td>
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### Peak Optimization Flags

**C benchmarks:**

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<tr>
<td>600.perlbench_s</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-mem-layout-trans=3 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-mem-layout-trans=3 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
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<td>625.x264_s</td>
<td>-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</td>
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Peak Optimization Flags (Continued)

657.xz_s: Same as 602.gcc_s

C++ benchmarks:
620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass l) -prof-use(pass 2) -ipo
-xCORE-AVX2 -03 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

623.xalancbmk_s: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass l) -prof-use(pass 2) -ipo
-xCORE-AVX2 -03 -no-prec-div -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 -xCORE-AVX2 -ipo
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Other Flags

C benchmarks:
-m64 -std=c11

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

623.xalancbnk_s: -m32

Fortran benchmarks:
-m64

The flags files that were used to format this result can be browsed at
## SPEC CPU2017 Integer Speed Result

### Dell Inc.

**PowerEdge C6420 (Intel Xeon Silver 4109T, 2.00 GHz)**

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**Test Date:** Mar-2018  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

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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