Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)  SPECspeed2017_int_base = 6.92

SPECspeed2017_int_peak = 7.12

Threads

<table>
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<th>Hardware Availability: Sep-2017</th>
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</tr>
<tr>
<td>32</td>
<td>10.9</td>
<td>16.9</td>
</tr>
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</table>

CPU Name: Intel Xeon Silver 4110
Max MHz.: 3000
Nominal: 2100
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
Other: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
Storage: 1 TB SATA SSD
Other: None

OS: SUSE Linux Enterprise Server 12 SP3 (x86_64)
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Compiler for Linux:
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 4110, 2.10 GHz)

Programs:
- SPEC CPU2017 Integer Speed Result

SPECspeed2017_int_base = 6.92
SPECspeed2017_int_peak = 7.12

Test Date: Feb-2018
Hardware Availability: Sep-2017
Software Availability: Sep-2017

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<td>648.exchange2_s</td>
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<td>657.xz_s</td>
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</tbody>
</table>

SPECspeed2017_int_base = 6.92
SPECspeed2017_int_peak = 7.12

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 synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)

<table>
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CPU2017 License: 55  Test Date: Feb-2018
Test Sponsor: Dell Inc.  Hardware Availability: Sep-2017
Tested by: Dell Inc.  Software Availability: Sep-2017

### 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 96c45e4568ad54c135fd618bccc091c0f
- running on linux-5j67 Mon Feb 26 20:29:20 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

```plaintext
model name : Intel(R) Xeon(R) Silver 4110 CPU @ 2.10GHz
  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:

```plaintext
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 4110 CPU @ 2.10GHz
Stepping: 4
```

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

**Dell Inc.**

**PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)**

<table>
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<td>7.12</td>
</tr>
</tbody>
</table>

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

**Platform Notes (Continued)**

```plaintext
CPU MHz:               2095.173  
BogoMIPS:              4190.34  
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 rtscp  
                        lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc  
                        aperfmpref perfmon pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg  
                        fma cx16 xtpmr 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 invpdid_single pln pts  
                        dtherm intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vmx fms xfxs  
                        ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpdid rtm cmp mpx  
                        avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt  
                        xsavec xgetbvl cqm_llc cqm_occup_llc pkf ospe
```

/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: 94978 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: 96407 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10

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)
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)  

SPECspeed2017_int_base = 6.92  
SPECspeed2017_int_peak = 7.12

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Test Date: Feb-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 Feb 26 19:49

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)
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)

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<td>6.92</td>
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<td>Hardware Availability: Sep-2017</td>
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**Compiler Version Notes (Continued)**

---

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

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

---

### Dell Inc.

**PowerEdge C6420** (Intel Xeon Silver 4110, 2.10 GHz)

| SPECspeed2017_int_base | 6.92 |
| SPECspeed2017_int_peak | 7.12 |

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Test Date:** Feb-2018

**Tested by:** Dell Inc.

**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`

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)

SPECspeed2017_int_base = 6.92
SPECspeed2017_int_peak = 7.12

Peak Compiler Invocation (Continued)

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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-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

602.gcc_s: -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

605.mcf_s: -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

625.x264_s: -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

(Continued on next page)
Dell Inc.  
PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)

SPECspeed2017_int_base = 6.92
SPECspeed2017_int_peak = 7.12

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

Peak Optimization Flags (Continued)

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 -D SPEC_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 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -D SPEC_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:

The flags files that were used to format this result can be browsed at
### Dell Inc.

PowerEdge C6420 (Intel Xeon Silver 4110, 2.10 GHz)  

<table>
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**CPU2017 License:** 55  
**Test Date:** Feb-2018  
**Test Sponsor:** Dell Inc.  
**Hardware Availability:** Sep-2017  
**Tested by:** Dell Inc.  
**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.

Tested with SPEC CPU2017 v1.0.2 on 2018-02-26 21:29:19-0500.  
Report generated on 2018-10-31 17:08:36 by CPU2017 PDF formatter v6067.  
Originally published on 2018-03-20.