Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)

SPECspeed2017_int_base = 9.63
SPECspeed2017_int_peak = Not Run

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

Test Date: Dec-2017
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Threads

<table>
<thead>
<tr>
<th>Thread</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base (9.63)

Software

OS: CentOS Linux release 7.4.1708 (Core)
3.10.0-693.5.2.el7.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 1.0.8 released Jul-2017
File System: xfs

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc: jemalloc memory allocator library V5.0.1;

Hardware

CPU Name: Intel Xeon Gold 6144
Max MHz.: 4200
Nominal: 3500
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: 24.75 MB I+D on chip per chip
Other: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 480Gb SATA SSD
Other: None
Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)

SPECspeed2017_int_base = 9.63
SPECspeed2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Peak Seconds</th>
<th>Ratio</th>
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</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
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<tr>
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<td>32</td>
<td>195</td>
<td>15.1</td>
<td>194</td>
<td>15.2</td>
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<td>657.xz_s</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

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
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: 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

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
No: 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.
No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)

(Continued on next page)
Dell Inc.  
PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_peak =</th>
<th>Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_base =</td>
<td>9.63</td>
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</table>

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Dec-2017
Tested by: Dell Inc.
Hardware Availability: Sep-2017
Software Availability: Sep-2017

General Notes (Continued)

is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Platform Notes

BIOS settings:
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost enabled
C States disabled
Memory Patrol Scrub disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Thu Dec  7 22:37:08 2017

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) Gold 6144 CPU @ 3.50GHz
  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 2 3 9 16 19 26 27
    physical 1: cores 0 2 3 9 16 19 26 27

(Continued on next page)
<table>
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<th>Dell Inc.</th>
<th>PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)</th>
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<td>Software Availability: Sep-2017</td>
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</tbody>
</table>

**SPEC CPU2017 Integer Speed Result**

**SPECspeed2017_int_base** = 9.63

**SPECspeed2017_int_peak** = Not Run

**Platform Notes (Continued)**

```
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) Gold 6144 CPU @ 3.50GHz
Stepping: 4
CPU MHz: 3500.000
BogoMIPS: 7000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
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 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 fma cx16 xtpr pdcm pcid dca pvd pcispecid dca_pcd dca_pcl_mvl nta x救v f16c rdrand lahf_lm abm 3dnowprefetch ebixo cat_13 cpuid lp healthy intel_pt tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdvi aaxv512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_lll1 cqm_occup_llc cqm_mbb_modr cqm_mbb_modr_local dtherm ida arat pni pt

/proc/cpuinfo cache data
cache size: 25344 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: 96965 MB
- node 0 free: 94303 MB
- node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
- node 1 size: 98304 MB
- node 1 free: 95556 MB

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

Dell Inc.  
PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)  

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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Dec-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

---

**Platform Notes (Continued)**

```plaintext
node distances:
node 0 1
  0: 10 21
  1: 21 10
```

From `/proc/meminfo`
```
MemTotal: 196690028 kB
HugePages_Total: 128
Hugepagesize: 2048 kB
```

From `/etc/*release* /etc/*version*`
```
centos-release: CentOS Linux release 7.4.1708 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.4 (Source)
```
```
os-release:
   NAME="CentOS Linux"
   VERSION="7 (Core)"
   ID="centos"
   ID_LIKE="rhel fedora"
   VERSION_ID="7"
   PRETTY_NAME="CentOS Linux 7 (Core)"
   ANSI_COLOR="0;31"
   CPE_NAME="cpe:/o:centos:centos:7"
redhat-release: CentOS Linux release 7.4.1708 (Core)
system-release: CentOS Linux release 7.4.1708 (Core)
system-release-cpe: cpe:/o:centos:centos:7
```

```
uname -a:
Linux localhost.localdomain 3.10.0-693.5.2.el7.x86_64 #1 SMP Fri Oct 20 20:32:50 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Dec 7 22:34
```

```
SPEC is set to: /root/cpu2017
```
```
Filesystem  Type  Size  Used  Avail Use% Mounted on
/dev/sda2   xfs   433G   25G   409G   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. 1.0.8 07/12/2017
Memory:
  12x 00CE063672000CE M393A2K4333B1-CTD 16 GB 2 rank 2666
  4x Not Specified Not Specified
```

(End of data from sysinfo program)
SPEC CPU2017 Integer Speed Result

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)

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CPU2017 License: 55
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Compiler Version Notes

<table>
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<tr>
<th>CC</th>
<th>600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)</th>
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</thead>
<tbody>
<tr>
<td>icc (ICC)</td>
<td>18.0.0 20170811 Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
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<table>
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<tr>
<th>CXXC</th>
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<td>icpc (ICC)</td>
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<table>
<thead>
<tr>
<th>FC</th>
<th>648.exchange2_s(base)</th>
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<tbody>
<tr>
<td>ifort (IFORT)</td>
<td>18.0.0 20170811 Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

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
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64

(Continued on next page)
Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6144, 3.50 GHz)

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### Base Portability Flags (Continued)

- 641.leela_s: -DSPEC_LP64
- 648.exchange2_s: -DSPEC_LP64
- 657.xz_s: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -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-AVX512 -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`

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 v1.0.2 on 2017-12-07 23:37:07-0500.
Originally published on 2018-02-27.