### Dell Inc. PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)

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

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

<table>
<thead>
<tr>
<th>Thread</th>
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</tr>
<tr>
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<td>12</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>12</td>
</tr>
<tr>
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<td>12</td>
</tr>
<tr>
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<td>12</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>12</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>12</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>12</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>12</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>12</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Bronze 3104  
- **Max MHz.:** 1700  
- **Nominal:** 1700  
- **Enabled:** 12 cores, 2 chips  
- **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:** 8.25 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2133)  
- **Storage:** 480GB SATA SSD  
- **Other:** None

**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;
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>8.19</td>
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</tbody>
</table>

SPECspeed2017_int_base = 3.93
SPECspeed2017_int_peak = Not Run

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)
SPEC CPU2017 Integer Speed Result

Dell Inc.

PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECspeed2017_int_base = 3.93
SPECspeed2017_int_peak = Not Run

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 Fri Dec 15 00:09:02 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) Bronze 3104 CPU @ 1.70GHz
  2 "physical id"s (chips)
  12 "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
  physical 1: cores 0 1 2 3 4 5

(Continued on next page)
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Platform Notes (Continued)

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz
Stepping: 4
CPU MHz: 1700.000
BogoMIPS: 3400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0,2,4,6,8,10
NUMA node1 CPU(s): 1,3,5,7,9,11
Flags:
   fpu vme de pse 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 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 x86tg x86_64 xtpr pdcm pнии pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
   xsave f16c rdrand lahf_lm abm 3dnowprefetch ebpx cat_13 cdp_13 intel_pt
   tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
   erms invpcid rtm cmpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb
   avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc
   cqm_mbb_total cqm_mbb_local dtmerr arat pln pts

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
node 0 size: 96965 MB
node 0 free: 94348 MB
node 1 cpus: 1 3 5 7 9 11
node 1 size: 98304 MB
node 1 free: 95676 MB

(Continued on next page)
Dell Inc.  
PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)  

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Software Availability: Sep-2017  

Platform Notes (Continued)

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 15 00:07

SPEC is set to: /root/cpu2017  
Filesystem  Type  Size  Used Avail Use% Mounted on  
/dev/sda2      xfs   433G   18G  415G   5%  /

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 002C00B3002C 18ASF2G72PD2-2G6D1 16 GB 2 rank 2666, configured at 2133  
  4x Not Specified Not Specified

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

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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) 18.0.0 20170811
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.
------------------------------------------------------------------------------
==============================================================================
FC  648.exchange2_s(base)
------------------------------------------------------------------------------
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
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64

(Continued on next page)
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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-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

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.

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