<table>
<thead>
<tr>
<th>SPEC® CFP2006 Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Inc.</td>
</tr>
<tr>
<td>PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)</td>
</tr>
</tbody>
</table>

**SPECfp®2006 = 57.6**  
**SPECfp_base2006 = 56.7**

<table>
<thead>
<tr>
<th>Software Availability:</th>
<th>Jul-2017</th>
</tr>
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<tbody>
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</tr>
<tr>
<td>Test sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Nov-2016</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Bronze 3104  
- **CPU Characteristics:**  
  - CPU MHz: 1700  
  - FPU: Integrated  
  - CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip  
  - CPU(s) orderable: 1,2 chip  
  - Primary Cache: 32 KB I + 32 KB D on chip per core  
  - Secondary Cache: 1 MB I+D on chip per core

### Software

- **Operating System:** SUSE Linux Enterprise Server 12 SP2 (x86_64)  
  - 4.4.21-69-default  
- **Compiler:**  
  - C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;  
  - Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>22.7</td>
</tr>
<tr>
<td>416.gamess</td>
<td>21.7</td>
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<tr>
<td>433.milc</td>
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<td>434.zeusmp</td>
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<tr>
<td>435.gromacs</td>
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<tr>
<td>436.cactusADM</td>
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<tr>
<td>437.leslie3d</td>
<td>131</td>
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<tr>
<td>444.namd</td>
<td>16.8</td>
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<td>447.dealII</td>
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<td>459.GemsFDTD</td>
<td>31.4</td>
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<tr>
<td>465.tonto</td>
<td>112</td>
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<tr>
<td>470.lbm</td>
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<td>481.wrf</td>
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**SPECfp_base2006 = 56.7**  
**SPECfp2006 = 57.6**
Results Table

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

Operating System Notes

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

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
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
Dell Inc. PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz) SPECfp2006 = 57.6
SPECfp_base2006 = 56.7

CPU2006 license: 55
Test date: Jun-2017
Test sponsor: Dell Inc.
Hardware Availability: Jul-2017
Tested by: Dell Inc.
Software Availability: Nov-2016

Platform Notes (Continued)

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 /root/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e9d4b4eb51ed28d7f98696cbe290c1)
runtime on linux-38mh Wed Jun 7 15:54:24 2017

This section contains SUT (System Under Test) info as seen by
some common utilities. To remove or add to this section, see:
http://www.spec.org/cpu2006/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
cache size : 8448 KB

From /proc/meminfo
MemTotal: 197654280 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# 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-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 7 06:48

Continued on next page
### Dell Inc.

**PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)**

**SPECfp2006** = 57.6  
**SPECfp_base2006** = 56.7

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### Platform Notes (Continued)

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem     Type  Size  Used  Avail  Use% Mounted on
/dev/sda2      ext4  915G   10G   904G   2%  /

Additional information from dmidecode:

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. 1.1.1 06/05/2017
Memory:
12x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666 MHz, configured at 2133 MHz
4x Not Specified Not Specified

(End of data from sysinfo program)

### General Notes

Environment variables set by runspec before the start of the run:
```
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/root/cpu2006-1.2_ic17u3/lib/ia32:/root/cpu2006-1.2_ic17u3/lib/intel64:/root/cpu2006-1.2_ic17u3/sh10.2"
OMP_NUM_THREADS = "6"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.2
Transparent Huge Pages enabled by default.
Filesystem page cache cleared with:
```
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
```

### Base Compiler Invocation

C benchmarks:
```
icc -m64
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc -m64 ifort -m64
```
Dell Inc.

PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)

SPECfp2006 = 57.6
SPECfp_base2006 = 56.7

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
Test date: Jun-2017
Hardware Availability: Jul-2017
Software Availability: Nov-2016

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.games: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64
Dell Inc.
PowerEdge C6420 (Intel Xeon Bronze 3104, 1.70 GHz)

**SPECfp2006 =** 57.6  
**SPECfp_base2006 =** 56.7

**CPU2006 license:** 55  
**Test date:** Jun-2017  
**Test sponsor:** Dell Inc.  
**Hardware Availability:** Jul-2017  
**Tested by:** Dell Inc.  
**Software Availability:** Nov-2016

---

**Peak Portability Flags**

Same as Base Portability Flags

---

**Peak Optimization Flags**

**C benchmarks:**

- 433.milc: basepeak = yes
- 470.lbm: basepeak = yes
- 482.sphinx3: basepeak = yes

**C++ benchmarks:**

- 444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
  -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
  -no-prec-div(pass 2) -fno-alias -auto-ilp32
- 447.dealII: basepeak = yes
- 450.soplex: basepeak = yes
- 453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
  -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
  -no-prec-div(pass 2) -unroll4 -ansi-alias

**Fortran benchmarks:**

- 410.bwaves: basepeak = yes
- 416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
  -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
  -no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-
- 434.zeusmp: basepeak = yes
- 437.leslie3d: basepeak = yes
- 459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
  -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
  -no-prec-div(pass 2) -unroll2 -inline-level=0 -qopt-prefetch -parallel
- 465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
  -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
  -no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3  
  -auto -unroll4

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

SPECfp2006 = 57.6
SPECfp_base2006 = 56.7

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jun-2017
Hardware Availability: Jul-2017
Software Availability: Nov-2016

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32
481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml

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For other inquiries, please contact webmaster@spec.org.

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