**Dell Inc.**

PowerEdge C6420 (Intel Xeon Gold 6138, 2.00 GHz)

---

**SPECfp®2006 = 141**  
**SPECfp_base2006 = 134**

<table>
<thead>
<tr>
<th>Test date:</th>
<th>Jun-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license:</td>
<td>55</td>
</tr>
<tr>
<td>Test sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2016</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>52.7</td>
</tr>
<tr>
<td>416.gamess</td>
<td>49.1</td>
</tr>
<tr>
<td>433.milc</td>
<td>76.2</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>259</td>
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<tr>
<td>435.gromacs</td>
<td>45.1</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>1120</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>430</td>
</tr>
<tr>
<td>444.namd</td>
<td>36.2</td>
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<tr>
<td>447.dealII</td>
<td>72.1</td>
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<tr>
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<td>459.GemsFDTD</td>
<td>318</td>
</tr>
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<td>465.tonto</td>
<td>288</td>
</tr>
<tr>
<td>470.lbm</td>
<td>129</td>
</tr>
<tr>
<td>481.wrf</td>
<td>62.1</td>
</tr>
</tbody>
</table>

---

**SPECfp_base2006 = 134**

---

**SPECfp2006 = 141**

---

**Hardware**

- **CPU Name:** Intel Xeon Gold 6138  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz  
- **CPU MHz:** 2000  
- **FPU:** Integrated  
- **CPU(s) enabled:** 40 cores, 2 chips, 20 cores/chip, 2 threads/core  
- **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)  
- **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  
- **Auto Parallel:** Yes  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)
### SPEC CFP2006 Result

**Dell Inc.**

**PowerEdge C6420 (Intel Xeon Gold 6138, 2.00 GHz)**

SPECfp2006 = 141  
SPECfp_base2006 = 134

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<td>Tested by: Dell Inc.</td>
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<tr>
<td>L3 Cache: 27.5 MB I+D on chip per chip</td>
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<tr>
<td>Test sponsor: Dell Inc.</td>
</tr>
<tr>
<td>Other Cache: None</td>
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<tr>
<td>Hardware Availability: Jul-2017</td>
</tr>
<tr>
<td>Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)</td>
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<td>Software Availability: Nov-2016</td>
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<tr>
<td>Other Hardware: None</td>
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<tr>
<td>L3 Cache: 27.5 MB I+D on chip per chip</td>
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<tr>
<td>Base Pointers: 64-bit</td>
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<tr>
<td>Other Cache: None</td>
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<tr>
<td>Peak Pointers: 32/64-bit</td>
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<tr>
<td>Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)</td>
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<td>Other Software: None</td>
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#### Results Table

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<tr>
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<th>Seconds</th>
<th>Ratio</th>
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<td>314</td>
<td>62.0</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"

### 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
- Energy Efficiency Policy set to Performance

Continued on next page
Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6138, 2.00 GHz)

SPECfp2006 = 141
SPECfp_base2006 = 134

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)

Memory Patrol Scrub disabled
Logical Processor enabled
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)
running on linux-xp0h Wed Jun 28 01:41:44 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) Gold 6138 CPU @ 2.00GHz
 2 "physical id"s (chips)
 80 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 20
siblings : 40
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
cache size : 28160 KB

From /proc/meminfo
MemTotal: 196687624 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:
Linux linux-xp0h 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
(9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 27 21:14

Continued on next page
**SPEC CFP2006 Result**

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Gold 6138, 2.00 GHz)

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**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Test date:** Jun-2017

**Tested by:** Dell Inc.

**Hardware Availability:** Jul-2017

**Software Availability:** Nov-2016

---

**Platform Notes (Continued)**

SPEC is set to: /root/cpu2006-1.2_ic17u3

Filesystem | Type | Size | Used | Avail | Use% | Mounted on
---|---|---|---|---|---|---
/dev/sda2 | xfs | 930G | 11G | 919G | 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 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666 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 = "40"

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 Gold 6138, 2.00 GHz)

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

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -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.cactusADM: -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 Gold 6138, 2.00 GHz)

SPECfp2006 = 141
SPECfp_base2006 = 134

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-iiP32

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
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