# SPEC® CFP2006 Result

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Gold 5120, 2.20 GHz)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>45.6</td>
<td>42.5</td>
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<tr>
<td>416.gameess</td>
<td>68.5</td>
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<td>433.milc</td>
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<td>434.zeusmp</td>
<td>44.1</td>
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<tr>
<td>435.gromacs</td>
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<tr>
<td>482.sphinx3</td>
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</tr>
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</table>

**CPU2006 license:** 55

**Test date:** Jun-2017

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Hardware**

- **CPU Name:** Intel Xeon Gold 5120
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz
- **CPU MHz:** 2200
- **FPU:** Integrated
- **CPU(s) enabled:** 28 cores, 2 chips, 14 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) 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
- **Auto Parallel:** Yes
- **File System:** ext4
- **System State:** Run level 3 (multi-user)
SPEC CFP2006 Result

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 5120, 2.20 GHz)

**SPECfp2006** = 126

**SPECfp_base2006** = 121

---

**CPU2006 license:** 55

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**Tested by:** Dell Inc.

**Test date:** Jun-2017

**Hardware Availability:** Jul-2017

**Software Availability:** Nov-2016

**L3 Cache:** 19.25 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 384 GB (12 x 32 GB 2Rx8 PC4-2666V-R, running at 2400 MT/s)

**Disk Subsystem:** 1 x 960 GB SATA SSD

**Other Hardware:** None

**Base Pointers:** 64-bit

**Peak Pointers:** 32/64-bit

**Other Software:** None

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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
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</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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**Operating System Notes**

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

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**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 Gold 5120, 2.20 GHz)

SPECfp2006 = 126
SPECfp_base2006 = 121

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

Platform Notes (Continued)

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/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-fx60 Mon Jun 12 17:02:10 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 5120 CPU @ 2.20GHz
  2 "physical id"s (chips)
  56 "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 : 14
  siblings : 28
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  cache size : 19712 KB

From /proc/meminfo
MemTotal: 394868380 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-fx60 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
  (9464f67) x86_64 x86_64 x86_64 GNU/Linux

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Platform Notes (Continued)

run-level 3 Jun 12 11:57

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem    Type     Size     Used    Avail   Use% Mounted on
/dev/sda2      ext4     909G    11G     898G    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:
  2x 002C0B3002C 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 MHz, configured at 2400
    MHz
  10x 002C0632002C 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 MHz, configured at 2400
    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 = "28"

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 5120, 2.20 GHz)

| SPECfp2006 | 126 |
| SPECfp_base2006 | 121 |

**CPU2006 license:** 55  
**Test date:** Jun-2017  
**Test sponsor:** Dell Inc.  
**Hardware Availability:** Jul-2017  
**Testing 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 -nofor_main  
- 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 Gold 5120, 2.20 GHz)  

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### 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-iipt32
- **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

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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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