# SPEC® CINT2006 Result

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

<table>
<thead>
<tr>
<th>SPECint®2006</th>
<th>63.1</th>
</tr>
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<tbody>
<tr>
<td>SPECint_base2006</td>
<td>60.4</td>
</tr>
</tbody>
</table>

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

## Hardware

<table>
<thead>
<tr>
<th>Hardware Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 5118</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.20 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2300</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>24 cores, 2 chips, 12 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1.2 chip</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>16.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>384 GB (12 x 32 GB 2Rx8 PC4-2400T-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Software Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>btrfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>Microquill SmartHeap V10.2</td>
</tr>
</tbody>
</table>
Dell Inc.

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SPECint_base2006 = 60.4

CPU2006 license: 55
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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>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>243</td>
<td>40.2</td>
<td>243</td>
<td>40.2</td>
<td>243</td>
<td>40.1</td>
<td>213</td>
<td>45.9</td>
<td>213</td>
<td>45.8</td>
<td>213</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>387</td>
<td>24.9</td>
<td>388</td>
<td>24.9</td>
<td>387</td>
<td>24.9</td>
<td>385</td>
<td>25.1</td>
<td>385</td>
<td>25.1</td>
<td>387</td>
</tr>
<tr>
<td>403.gcc</td>
<td>275</td>
<td>29.2</td>
<td>275</td>
<td>29.2</td>
<td>275</td>
<td>29.2</td>
<td>277</td>
<td>29.1</td>
<td>281</td>
<td>28.7</td>
<td>277</td>
</tr>
<tr>
<td>429.mcf</td>
<td>372</td>
<td>28.2</td>
<td>372</td>
<td>28.2</td>
<td>371</td>
<td>28.3</td>
<td>363</td>
<td>28.9</td>
<td>363</td>
<td>28.9</td>
<td>362</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>136</td>
<td>67.0</td>
<td>135</td>
<td>67.6</td>
<td>135</td>
<td>67.8</td>
<td>132</td>
<td>68.9</td>
<td>132</td>
<td>68.8</td>
<td>133</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>379</td>
<td>32.0</td>
<td>378</td>
<td>32.0</td>
<td>379</td>
<td>31.9</td>
<td>371</td>
<td>32.6</td>
<td>371</td>
<td>32.6</td>
<td>371</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>3.75</td>
<td>5520</td>
<td>3.85</td>
<td>5390</td>
<td>3.77</td>
<td>5490</td>
<td>3.75</td>
<td>5520</td>
<td>3.85</td>
<td>5390</td>
<td>3.77</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>369</td>
<td>60.0</td>
<td>370</td>
<td>59.8</td>
<td>369</td>
<td>59.9</td>
<td>369</td>
<td>60.0</td>
<td>370</td>
<td>59.8</td>
<td>369</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>273</td>
<td>22.9</td>
<td>273</td>
<td>22.9</td>
<td>273</td>
<td>22.9</td>
<td>221</td>
<td>28.3</td>
<td>220</td>
<td>28.4</td>
<td>223</td>
</tr>
<tr>
<td>473.astar</td>
<td>218</td>
<td>32.3</td>
<td>221</td>
<td>31.8</td>
<td>220</td>
<td>32.0</td>
<td>220</td>
<td>31.9</td>
<td>223</td>
<td>31.5</td>
<td>220</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>106</td>
<td>65.1</td>
<td>106</td>
<td>65.2</td>
<td>106</td>
<td>64.9</td>
<td>93.8</td>
<td>73.5</td>
<td>93.7</td>
<td>73.6</td>
<td>93.6</td>
</tr>
</tbody>
</table>

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

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
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 (b5e8d4b4e6b51ed28d7f98696cbe290c1)
runtime on linux-7lna Fri Jun 23 10:07:11 2017
Continued on next page
Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

**SPECint2006 = 63.1**

**SPECint_base2006 = 60.4**

CPU2006 license: 55  
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**Test date:** Jun-2017  
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**Platform Notes (Continued)**

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 5118 CPU @ 2.30GHz
- 2 "physical id"s (chips)
- 48 "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 : 12
  - siblings : 24
  - physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
  - physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
- cache size : 16896 KB

From `/proc/meminfo`

- MemTotal: 394867844 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/etc/*release* /etc/*version*`

- **SuSE-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 15 13:47

- **SPEC is set to:** /root/cpu2006-1.2_ic17u3
- **Filesystem**
  - Type Size Used Avail Use% Mounted on
  - /dev/sda6 btrfs 272G 8.1G 263G 3% /

Additional information from `dmidecode`:

Warning: Use caution when you interpret this section. The 'dmidecode' program

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Platform Notes (Continued)

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 36ASF4G72P2-2G3B1 32 GB 2 rank 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,scatter"
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 = "24"

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

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
Dell Inc. PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

SPECint2006 = 63.1
SPECint_base2006 = 60.4

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch
-auto-p32

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-W1,-z,muldefs -L/sh10.2 -lsmartheap64

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
  icc -m64
  400.perlbench: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
  445.gobmk: icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

C++ benchmarks (except as noted below):
  icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
  473.astar: icpc -m64

Peak Portability Flags

  400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
  401.bzip2: -DSPEC_CPU_LP64
  403.gcc: -DSPEC_CPU_LP64
  429.mcf: -DSPEC_CPU_LP64
  445.gobmk: -D_FILE_OFFSET_BITS=64
  456.hmmer: -DSPEC_CPU_LP64
  458.sjeng: -DSPEC_CPU_LP64
  462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
  464.h264ref: -DSPEC_CPU_LP64
  471.omnetpp: -D_FILE_OFFSET_BITS=64
  473.astar: -DSPEC_CPU_LP64
  483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
# Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

**SPECint2006 =** 63.1  
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</table>

## Peak Optimization Flags

### C benchmarks:

- `400.perlbench`: `-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) -qopt-prefetch`

- `401.bzip2`: `-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 -auto-ilp32 -qopt-prefetch`

- `403.gcc`: `-xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc -qopt-malloc-options=3 -auto-ilp32`

- `429.mcf`: `-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch -auto-p32`

- `445.gobmk`: `-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)`

- `456.hmmer`: `basepeak = yes`

- `458.sjeng`: `-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`

- `462.libquantum`: `basepeak = yes`

- `464.h264ref`: `basepeak = yes`

### C++ benchmarks:

- `471.omnetpp`: `-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) -qopt-ra-region-strategy=block -Wl,-z,muldefs -L/sh10.2 -lsmartheap`

- `473.astar`: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32 -Wl,-z,muldefs -L/sh10.2 -lsmartheap64`

- `483.xalancbmk`: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -Wl,-z,muldefs -L/sh10.2 -lsmartheap`

## Peak Other Flags

### C benchmarks:

Continued on next page
SPEC CINT2006 Result

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Peak Other Flags (Continued)

403.gcc: -Dalloca=_alloca

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 questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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