Dell Inc.
PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

**SPECint®2006** = 63.1
**SPECint_base2006** = 60.4

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

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

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default</td>
<td>CPU Name: Intel Xeon Gold 5118</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz</td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td>CPU MHz: 2300</td>
</tr>
<tr>
<td>File System: btrfs</td>
<td>FPU: Integrated</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>Base Pointers: 32/64-bit</td>
<td>CPU(s) orderable: 1.2 chip</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td></td>
<td>L3 Cache: 16.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td></td>
<td>Other Cache: None</td>
</tr>
<tr>
<td></td>
<td>Memory: 384 GB (12 x 32 GB 2Rx8 PC4-2400T-R)</td>
</tr>
<tr>
<td></td>
<td>Disk Subsystem: 1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td></td>
<td>Other Hardware: None</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<tbody>
<tr>
<td>15.9</td>
<td>24.9</td>
<td>29.2</td>
<td>67.6</td>
<td>28.9</td>
<td>28.2</td>
<td>32.0</td>
<td></td>
<td>59.9</td>
<td>22.9</td>
<td>32.0</td>
<td>65.1</td>
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</tbody>
</table>

**SPECint2006** = 63.1

CPU(s): 24 cores, 2 chips, 12 cores/chip, 2 threads/core
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip, 2 threads/core
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**SPEC CINT2006 Result**

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

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

**SPECint2006 = 63.1**

**SPECint_base2006 = 60.4**

---

### 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>Seconds</th>
<th>Ratio</th>
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</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>
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<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>
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<tr>
<td>403.gcc</td>
<td>275</td>
<td>29.2</td>
<td>275</td>
<td>29.2</td>
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<td>29.2</td>
<td>277</td>
<td>29.1</td>
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<td>29.1</td>
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<tr>
<td>456.hmmer</td>
<td>379</td>
<td>32.0</td>
<td>378</td>
<td>32.0</td>
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<td>31.9</td>
<td>371</td>
<td>32.6</td>
<td>371</td>
<td>32.6</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>
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<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>
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<tr>
<td>471.omnetpp</td>
<td>273</td>
<td>22.9</td>
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<td>22.9</td>
<td>221</td>
<td>28.3</td>
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<td>28.3</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>
</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>
</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 (b5e8d4b4eb51ed28d7f98696cbe290c1)
- running on linux-7lna Fri Jun 23 10:07:11 2017

Continued on next page
SPEC CINT2006 Result

Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

SPECint2006 = 63.1
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CPU2006 license: 55
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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:
  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-7lna 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 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
Continued on next page
SPEC CINT2006 Result

Dell Inc.
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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 36ASF4G72PZ-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
### SPEC CINT2006 Result

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Gold 5118, 2.30 GHz)

| SPECint2006 = | 63.1 |
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**CPU2006 license:** 55
**Test date:** Jun-2017
**Test sponsor:** Dell Inc.
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**Software Availability:** Nov-2016

### Base Optimization Flags

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

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

### Base Other Flags

**C benchmarks:**
- `403.gcc`  
  
  `-Dalloca=_alloca`

### Peak Compiler Invocation

**C benchmarks (except as noted below):**

- Allocate `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):**

- Allocate `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`  
  `-DSPEC_CPU_LINUX`

- 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`
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:
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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 other inquiries, please contact webmaster@spec.org.

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