Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6126, 2.60 GHz)

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

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

SPECint2006 = 45.6
SPECint_base2006 = 41.5

**Hardware**

- **CPU Name:** Intel Xeon Gold 6126
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz
- **CPU MHZ:** 2600
- **FPU:** Integrated
- **CPU(s) enabled:** 24 cores, 2 chips, 12 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
- **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)
- **Disk Subsystem:** 1 x 960 GB SATA SSD
- **Other Hardware:** None

**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
- **Auto Parallel:** Yes
- **File System:** ext4
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32/64-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.2
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>128</td>
<td>54.1</td>
<td>128</td>
<td>54.1</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 (b5e8d4b4eb51ed28d7f98e96cbe290c1)
running on linux-fx60 Sat Jul  8 10:18:44 2017
Continued on next page
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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 6126 CPU @ 2.60GHz
  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 1 2 3 4 5 6 8 9 10 11 12 13
  physical 1: cores 0 1 3 4 5 6 8 9 10 11 12 13
  cache size : 19712 KB

From /proc/meminfo
MemTotal: 395642524 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

run-level 3 Jul 8 10:15

SPEC is set to: /root/cpu2006-1.2.ic17u3
 Filesystem  Type  Size   Used Avail Use% Mounted on
/dev/sda2    ext4  909G  8.9G  900G  1%  /

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
**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. 1.0.6 06/22/2017
Memory:
2x 002C0B3002C 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 MHz
10x 002C0632002C 36ASF4G72PZ-2G6D1 32 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,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

<table>
<thead>
<tr>
<th>benchmark</th>
<th>flags</th>
</tr>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64</td>
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# SPEC CINT2006 Result

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## Base Portability Flags (Continued)

483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

## 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
-llw,-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

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SPEC CINT2006 Result

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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~call~loc
~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
~W1~,z,muldefs ~L/sh10.2 ~lsmartheap

473.astar: ~xCORE~AVX2 ~ipo ~O3 ~no~prec~div ~qopt~prefetch
~auto~p32 ~W1~,z,muldefs ~L/sh10.2 ~lsmartheap64

Peak Portability Flags (Continued)

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

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Test sponsor: Dell Inc.  Hardware Availability: Jul-2017
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Peak Optimization Flags (Continued)

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

Peak Other Flags

C benchmarks:

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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