Dell Inc.

PowerEdge FC640 (Intel Xeon Gold 6136, 3.00 GHz)

SPECint<sup>®</sup>2006 = 78.1
SPECint<sub>base</sub>2006 = 74.8

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

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

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**Hardware**

CPU Name: Intel Xeon Gold 6136
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHZ: 3000
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: 24.75 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 960 GB SATA SSD
Other Hardware: None

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**Software**

Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.16-56-default
Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux
Auto Parallel: Yes
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.2
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>400.perlbench</td>
<td>208</td>
<td>47.0</td>
<td>209</td>
<td>46.7</td>
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<td>401.bzip2</td>
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<td>28.5</td>
<td>340</td>
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<td>429.mcf</td>
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<td>445.gobmk</td>
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<td>456.hmmer</td>
<td>95.2</td>
<td>98.0</td>
<td>96.1</td>
<td>97.1</td>
<td>96.0</td>
<td>97.2</td>
<td>95.2</td>
<td>98.0</td>
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<td>458.sjeng</td>
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<td>37.0</td>
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<td>37.0</td>
<td>321</td>
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<td>462.libquantum</td>
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<td>2.87</td>
<td>7220</td>
<td>2.90</td>
<td>7140</td>
<td>2.89</td>
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<td>71.5</td>
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<td>71.2</td>
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<tr>
<td>471.omnetpp</td>
<td>171</td>
<td>36.6</td>
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<td>473.astar</td>
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<td>39.2</td>
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<td>39.4</td>
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<tr>
<td>483.xalancbmk</td>
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<td>83.8</td>
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<td>83.7</td>
<td>83.2</td>
<td>82.9</td>
<td>76.9</td>
<td>89.7</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 (b5e8d4eb51ed28d7f98696cbe290c1)
  - running on linux-u8yg Thu Sep 7 05:38:27 2017

Continued on next page
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 6136 CPU @ 3.00GHz
   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 8 9 10 11 18 19 24 27
   physical 1: cores 0 1 2 3 4 9 10 16 18 19 25 26
   cache size : 25344 KB

From /proc/meminfo
   MemTotal:       196687636 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-u8yg 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016
         (5b281a8) x86_64 x86_64 x86_64 GNU/Linux

   SPEC is set to: /root/cpu2006-1.2_ic17u3
   Filesystem     Type    Size  Used Avail Use% Mounted on
   /dev/sda1      btrfs  921G   17G  902G   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
SPEC CINT2006 Result

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Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to
hardware, firmware, and the "DMTF SM BIOS" standard.

BIOS Dell Inc. 1.0.0 08/10/2017
Memory:
12x 00AD00B300AD HMA82GR7AFR8N-VK 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,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
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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
-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):
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_OFFSETBITS=64 -DSPEC_CPU_LINUX
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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: basepeak = yes
403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div -inline-calloc
          -qopt-malloc-options=3 -auto-ilp32
429.mcf: basepeak = yes
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: basepeak = yes
483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
          -Wl,-z,muldefs -L/sh10.2 -lsmartheap

Peak Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca
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You can also download the XML flags sources by saving the following links:

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