Dell Inc.

PowerEdge M640 (Intel Xeon Gold 6128, 3.40 GHz)

SPECint®2006 = 75.2
SPECint_base2006 = 72.0

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

Dell Inc.
PowerEdge M640 (Intel Xeon Gold 6128, 3.40 GHz)

CPU Name: Intel Xeon Gold 6128
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3400
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 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: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 960 GB SATA SSD
Other Hardware: None

Software
Operating System: SUSE Linux Enterprise Server 12 SP3 4.4.70-2-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
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Hardware Availability: Sep-2017
Software Availability: Sep-2017

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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<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>208</td>
<td>46.9</td>
<td>209</td>
<td>46.8</td>
<td>209</td>
<td>46.8</td>
<td>184</td>
<td>53.0</td>
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<tr>
<td>403.gcc</td>
<td>189</td>
<td>42.6</td>
<td>188</td>
<td>42.7</td>
<td>189</td>
<td>42.5</td>
<td>187</td>
<td>43.2</td>
</tr>
<tr>
<td>429.mcf</td>
<td>314</td>
<td>33.4</td>
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<td>33.4</td>
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<td>33.4</td>
<td>310</td>
<td>33.8</td>
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<td>456.hmmer</td>
<td>95.9</td>
<td>97.2</td>
<td>96.0</td>
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<td>96.3</td>
<td>96.8</td>
<td>95.9</td>
<td>97.2</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>330</td>
<td>36.7</td>
<td>330</td>
<td>36.7</td>
<td>330</td>
<td>36.7</td>
<td>324</td>
<td>37.3</td>
</tr>
<tr>
<td>462.libquantum</td>
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<td>5180</td>
<td>3.99</td>
<td>5190</td>
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<tr>
<td>464.h264ref</td>
<td>307</td>
<td>72.0</td>
<td>306</td>
<td>72.2</td>
<td>307</td>
<td>72.1</td>
<td>307</td>
<td>72.1</td>
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<tr>
<td>471.omnetpp</td>
<td>204</td>
<td>30.6</td>
<td>197</td>
<td>31.7</td>
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<td>31.7</td>
<td>148</td>
<td>42.1</td>
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<tr>
<td>473.astar</td>
<td>181</td>
<td>38.9</td>
<td>183</td>
<td>38.4</td>
<td>181</td>
<td>38.7</td>
<td>182</td>
<td>38.6</td>
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<tr>
<td>483.xalancbmk</td>
<td>85.7</td>
<td>80.5</td>
<td>85.5</td>
<td>80.7</td>
<td>85.0</td>
<td>81.2</td>
<td>78.6</td>
<td>87.8</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-ejwa Tue Aug 29 23:05:45 2017

Continued on next page
SPEC CINT2006 Result

Dell Inc.

PowerEdge M640 (Intel Xeon Gold 6128, 3.40 GHz)

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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 6128 CPU @ 3.40GHz
2 "physical id"s (chips)
24 "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 : 6
siblings : 12
physical 0: cores 0 6 9 10 11 13
physical 1: cores 0 6 9 10 11 13
cache size : 19712 KB

From /proc/meminfo
MemTotal: 196682072 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3
# 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-SP3"
VERSION_ID=12.3
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID=sles
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
Linux linux-ejwa 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017
(4502c76) x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Aug 29 23:05

SPEC is set to: /root/cpu2006-1.2_ic17u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 btrfs 855G 7.0G 847G 1% /
Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
Continued on next page
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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. 1.0.0 08/10/2017
Memory:
9x 002C00B3002C 18ASF2G72PD2-2G6D1 16 GB 2 rank 2666 MHz
3x 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 = "12"
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

Continued on next page
Dell Inc.

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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
-ml -m, multifeats -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

Continued on next page
SPEC CINT2006 Result

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**Tested by:** Dell Inc.  
**Software Availability:** Sep-2017

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

**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

Continued on next page
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Peak Optimization Flags (Continued)

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

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