Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)

SPECint®2006 = 79.2
SPECint_base2006 = 76.2

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

Hardware

<table>
<thead>
<tr>
<th>Software</th>
<th>Operating System: SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.70-2-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
<td></td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
<td></td>
</tr>
<tr>
<td>File System: btrfs</td>
<td></td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td></td>
</tr>
<tr>
<td>Base Pointers: 32/64-bit</td>
<td></td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td></td>
</tr>
<tr>
<td>Other Software: Microquill SmartHeap V10.2</td>
<td></td>
</tr>
</tbody>
</table>

CPU Name: Intel Xeon Platinum 8170
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 2100
FPU: Integrated
CPU(s) enabled: 52 cores, 2 chips, 26 cores/chip, 2 threads/core
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 35.75 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
Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)

SPECint2006 = 79.2
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CPU2006 license: 55
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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>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>207</td>
<td>47.1</td>
<td>207</td>
<td>47.2</td>
<td>208</td>
<td>47.0</td>
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<tr>
<td>401.bzip2</td>
<td>340</td>
<td>28.3</td>
<td>340</td>
<td>28.4</td>
<td>344</td>
<td>28.0</td>
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<tr>
<td>403.gcc</td>
<td>228</td>
<td>35.3</td>
<td>228</td>
<td>35.3</td>
<td>228</td>
<td>35.3</td>
</tr>
<tr>
<td>429.mcf</td>
<td>311</td>
<td>33.8</td>
<td>311</td>
<td>33.8</td>
<td>311</td>
<td>33.8</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>326</td>
<td>37.2</td>
<td>325</td>
<td>37.2</td>
<td>325</td>
<td>37.2</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>326</td>
<td>97.6</td>
<td>95.8</td>
<td>97.4</td>
<td>95.7</td>
<td>97.5</td>
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<tr>
<td>458.sjeng</td>
<td>326</td>
<td>37.2</td>
<td>325</td>
<td>37.2</td>
<td>325</td>
<td>37.2</td>
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<tr>
<td>462.libquantum</td>
<td>2.64</td>
<td>7840</td>
<td>2.59</td>
<td>7990</td>
<td>2.59</td>
<td>8010</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>328</td>
<td>67.6</td>
<td>328</td>
<td>67.5</td>
<td>329</td>
<td>67.2</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>134</td>
<td>46.7</td>
<td>136</td>
<td>46.0</td>
<td>139</td>
<td>44.8</td>
</tr>
<tr>
<td>473.astar</td>
<td>178</td>
<td>39.5</td>
<td>178</td>
<td>39.4</td>
<td>178</td>
<td>39.5</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>81.7</td>
<td>84.5</td>
<td>80.5</td>
<td>85.7</td>
<td>81.1</td>
<td>85.1</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 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-ejwa Sat Sep 9 02:25:16 2017
Continued on next page
**SPEC CINT2006 Result**

**Dell Inc.**

PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)

| SPECint2006 = | 79.2 |
| SPECint_base2006 = | 76.2 |

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

**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) Platinum 8170 CPU @ 2.10GHz
- 2 "physical id"s (chips)
- 104 "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: 26
  - siblings: 52
  - physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
  - physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
- cache size: 36608 KB

From /proc/meminfo

- MemTotal: 196682072 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

SuSE-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 Sep 9 02:25

SPEC is set to: /root/cpu2006-1.2_ic17u3

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 btrfs 855G 7.0G 848G 1% /

Additional information from dmidecode:

Continued on next page
Dell Inc.  
PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)  

**SPECint2006 = 79.2**  
**SPECint_base2006 = 76.2**

**Platform Notes (Continued)**

Warning: Use caution when you interpret this section. The 'dmidecode' program 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 18ASF2G72PDZ-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 = "52"

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:  
CC -m64

C++ benchmarks:  
CC -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

Continued on next page
SPEC CINT2006 Result

Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)

SPECint2006 = 79.2
SPECint_base2006 = 76.2

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

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

Base Portability Flags (Continued)

471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
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
-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

Continued on next page
Dell Inc.  
PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)  

SPECint2006 = 79.2  
SPECint_base2006 = 76.2

Peak Portability Flags (Continued)

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

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  
  -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
Dell Inc.

PowerEdge M640 (Intel Xeon Platinum 8170, 2.10 GHz)

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

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

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

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For other inquiries, please contact webmaster@spec.org.

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