## SPEC® CFP2006 Result

### Dell Inc.

**PowerEdge M640** (Intel Xeon Platinum 8160, 2.10 GHz)

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 146</td>
<td>= 140</td>
</tr>
</tbody>
</table>

**CPU2006 license**: 55  
**Test date**: Sep-2017  
**Test sponsor**: Dell Inc.  
**Tested by**: Dell Inc.  
**Hardware Availability**: Sep-2017  
**Software Availability**: Nov-2016

#### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name</strong></td>
<td>Intel Xeon Platinum 8160</td>
</tr>
<tr>
<td><strong>CPU Characteristics</strong></td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td><strong>CPU MHz</strong></td>
<td>2100</td>
</tr>
<tr>
<td><strong>FPU</strong></td>
<td>Integrated</td>
</tr>
<tr>
<td><strong>CPU(s) enabled</strong></td>
<td>48 cores, 2 chips, 24 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td><strong>CPU(s) orderable</strong></td>
<td>1.2 chip</td>
</tr>
<tr>
<td><strong>Primary Cache</strong></td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Secondary Cache</strong></td>
<td>1 MB I+D on chip per core</td>
</tr>
</tbody>
</table>

#### Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating System</strong></td>
<td>SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.70-2-default</td>
</tr>
<tr>
<td><strong>Compiler</strong></td>
<td>C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux</td>
</tr>
<tr>
<td><strong>Auto Parallel</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>File System</strong></td>
<td>btrfs</td>
</tr>
<tr>
<td><strong>System State</strong></td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

### Benchmarks

- **410.bwaves**: 944.0  
- **416.gamess**: 49.2  
- **433.milc**: 79.0  
- **434.zeusmp**: 276  
- **435.gromacs**: 47.8  
- **436.cactusADM**: 490  
- **437.leslie3d**: 1150  
- **444.namd**: 36.2  
- **447.dealII**: 72.5  
- **450.soplex**: 54.5  
- **453.povray**: 79.5  
- **454.calculix**: 69.6  
- **459.GemDFDTD**: 311  
- **465.tonto**: 68.3  
- **470.lbm**: 48.4  
- **481.wrf**: 135  
- **482.sphinx3**: 66.5

**SPECfp_base2006 = 140**  
**SPECfp2006 = 146**

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## SPEC CFP2006 Result

### Dell Inc.

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- **CPU2006 license:** 55
- **Test sponsor:** Dell Inc.
- **Tested by:** Dell Inc.
- **CPU architectural information:**
  - L3 Cache: 33 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
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** None

### SPECfp2006 = **146**

### SPECfp_base2006 = **140**

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

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>135</td>
<td>82.3</td>
<td>136</td>
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<td>sphinx3</td>
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<td>66.5</td>
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<td>66.9</td>
<td>295</td>
<td>66.1</td>
<td>293</td>
<td>66.5</td>
<td>291</td>
<td>66.9</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### 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

Continued on next page
Dell Inc.
PowerEdge M640 (Intel Xeon Platinum 8160, 2.10 GHz)

| SPECfp2006 = | 146 |
| SPECfp_base2006 = | 140 |

**CPU2006 license:** 55
**Test sponsor:** Dell Inc.
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### Platform Notes (Continued)

- 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-8d7c Tue Sep 12 05:41:44 2017

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 8160 CPU @ 2.10GHz
- 2 "physical id"s (chips)
- 96 "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 : 24
  - siblings : 48
  - physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  - 27 28 29
  - physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  - 27 28 29
- cache size : 33792 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-8d7c 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017
- (4502c76) x86_64 x86_64 x86_64 GNU/Linux

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**Platform Notes (Continued)**

run-level 3 Sep 12 01:10

SPEC is set to: /root/cpu2006-1.2_ic17u3  
Filesystem    Type   Size  Used Avail Use% Mounted on  
/dev/sda3      btrfs  855G   11G  845G   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  
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:  
  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,compact,1,0"  
LD_LIBRARY_PATH = "/root/cpu2006-1.2_ic17u3/lib/intel64:/root/cpu2006-1.2_ic17u3/lib/ia32:/root/cpu2006-1.2_ic17u3/sh10.2"  
OMP_NUM_THREADS = "48"

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

Fortran benchmarks:  
  ifort -m64

Benchmarks using both Fortran and C:  
  icc -m64 ifort -m64
SPEC CFP2006 Result

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Base Portability Flags

<table>
<thead>
<tr>
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<th>Flags</th>
</tr>
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<tbody>
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<td>410.bwaves</td>
<td><code>--DSPEC_CPU_LP64</code></td>
</tr>
<tr>
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</tr>
<tr>
<td>435.gromacs</td>
<td><code>--nofor_main</code></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td><code>--nofor_main</code></td>
</tr>
<tr>
<td>474.dealII</td>
<td><code>--DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>450.soplex</td>
<td><code>--DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>454.calculix</td>
<td><code>--nofor_main</code></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td><code>--DSPEC_CPU_LP64</code></td>
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<td>465.tonto</td>
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<td>471.lbm</td>
<td><code>--DSPEC_CPU_LP64</code></td>
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<tr>
<td>481.wrf</td>
<td><code>--DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td><code>--DSPEC_CPU_LP64</code></td>
</tr>
</tbody>
</table>

Base Optimization Flags

C benchmarks:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch`

C++ benchmarks:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`

Fortran benchmarks:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch`

Benchmarks using both Fortran and C:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch`

Peak Compiler Invocation

C benchmarks:
`icc -m64`

C++ benchmarks:
`icpc -m64`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`icc -m64 ifort -m64`
Dell Inc.

PowerEdge M640 (Intel Xeon Platinum 8160, 2.10 GHz)

SPECfp2006 = 146
SPECfp_base2006 = 140

CPU2006 license: 55
Test sponsor: Dell Inc.
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Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

- 433.milc: basepeak = yes
- 470.lbm: basepeak = yes
- 482.sphinx3: basepeak = yes

C++ benchmarks:

- 444.namd: -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) -fno-alias -auto-ilk32
- 447.dealII: basepeak = yes
- 450.soplex: basepeak = yes
- 453.povray: -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 -ansi-alias

Fortran benchmarks:

- 410.bwaves: basepeak = yes
- 416.gamess: -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) -unroll2 -inline-level=0 -scalar-rep-
- 434.zeusmp: basepeak = yes
- 437.leslie3d: basepeak = yes
- 459.GemsFDTD: -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) -unroll2 -inline-level=0 -qopt-prefetch -parallel
- 465.tonto: -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) -inline-calloc -qopt-malloc-options=3 -auto -unroll4

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### Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

- 435.gromacs: basepeak = yes
- 436.cactusADM: basepeak = yes
- 454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32
- 481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at:


You can also download the XML flags sources by saving the following links:


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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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