**SPEC® CFP2006 Result**

**Dell Inc.**

PowerEdge M640 (Intel Xeon Gold 6140, 2.30 GHz)

| SPECfp®2006 = | 145 |
| SPECfp_base2006 = | 138 |

**CPU2006 license:** 55  
**Test date:** Sep-2017  
**Hardware Availability:** Sep-2017

| Test sponsor: | Dell Inc. |
| Tested by: | Dell Inc. |
| Software Availability: | Nov-2016 |

- **410.bwaves**  
  - 52.7
- **416.gamess**  
  - 49.3
- **433.milc**  
  - 76.8
- **434.zeusmp**  
  - 268
- **435.gromacs**  
  - 50.5
- **436.cactusADM**
- **437.leslie3d**  
  - 450
- **444.namd**  
  - 36.2
- **447.dealII**  
  - 72.6
- **450.soplex**  
  - 51.1
- **453.povray**  
  - 80.0
- **454.calculix**  
  - 76.1
- **459.GemsFDTD**  
  - 71.3
- **465.tonto**  
  - 68.5
- **470.lbm**  
  - 49.6
- **481.wrf**  
  - 131
- **482.sphinx3**  
  - 69.3

**SPECfp_base2006 = 138**

**SPECfp2006 = 145**

### Hardware

| CPU Name: | Intel Xeon Gold 6140 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.70 GHz |
| CPU MHz: | 2300 |
| FPU: | Integrated |
| CPU(s) enabled: | 36 cores, 2 chips, 18 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 |

### Software

| Operating System: | SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.70-2-default |
| Compiler: | 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 |
| Auto Parallel: | Yes |
| File System: | btrfs |
| System State: | Run level 3 (multi-user) |

Continued on next page
### SPEC CFP2006 Result

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<table>
<thead>
<tr>
<th>L3 Cache:</th>
<th>24.75 MB I+D on chip per chip</th>
<th>Other Cache:</th>
<th>None</th>
<th>Memory:</th>
<th>192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)</th>
<th>Disk Subsystem:</th>
<th>1 x 960 GB SATA SSD</th>
<th>Other Hardware:</th>
<th>None</th>
<th>Base Pointers:</th>
<th>64-bit</th>
<th>Peak Pointers:</th>
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<th>Other Software:</th>
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### Results Table

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<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
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<td><strong>281</strong></td>
<td>69.3</td>
<td>282</td>
<td>69.1</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
SPEC CFP2006 Result

Dell Inc.

PowerEdge M640 (Intel Xeon Gold 6140, 2.30 GHz)

SPECfp2006 = 145
SPECfp_base2006 = 138

CPU2006 license: 55
Test date: Sep-2017
Test sponsor: Dell Inc.
Hardware Availability: Sep-2017
Tested by: 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 LI 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 Fri Sep 8 03:50:15 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) Gold 6140 CPU @ 2.30GHz
  2 "physical id"s (chips)
  72 "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 : 18
  siblings : 36
  physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  cache size : 25344 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 Sep 7 23:24

Continued on next page
**SPEC CFP2006 Result**

**Dell Inc.**

PowerEdge M640 (Intel Xeon Gold 6140, 2.30 GHz)

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---

**Platform Notes (Continued)**

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

Filesystem     Type   Size  Used Avail Use% Mounted on
/dev/sda3      btrfs  855G  8.6G  846G   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:
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,compact,1,0"
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 = "36"
```

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
```
Dell Inc.
PowerEdge M640 (Intel Xeon Gold 6140, 2.30 GHz)

\[
\begin{align*}
\text{SPECfp2006} & = \quad 145 \\
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\end{align*}
\]

CPU2006 license: 55
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Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leshe3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64 -nofor_main
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64 -nofor_main
454.calculix: -DSPEC_CPU_LP64 -nofor_main
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

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:
\texttt{icc -m64}

C++ benchmarks:
\texttt{icpc -m64}

Fortran benchmarks:
\texttt{ifort -m64}

Benchmarks using both Fortran and C:
\texttt{icc -m64 ifort -m64}
Dell Inc.  
PowerEdge M640 (Intel Xeon Gold 6140, 2.30 GHz)  

**SPEC CFP2006 Result**

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<tr>
<th>SPECfp2006</th>
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<tr>
<td>SPECfp_base2006</td>
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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-iipt32`
- `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` `-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`
- `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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Continued on next page
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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
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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