## Dell Inc.

**PowerEdge R440 (Intel Xeon Gold 6152, 2.10 GHz)**

**SPECfp®2006 = 145**  
**SPECfp_base2006 = 138**

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

### Hardware

<table>
<thead>
<tr>
<th>Tested by</th>
<th>Dell Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 6152</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2100</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>44 cores, 2 chips, 22 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1.2 chip</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>1 MB I+D on chip per core</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Tested by</th>
<th>Dell Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default</td>
</tr>
<tr>
<td>Compiler:</td>
<td></td>
</tr>
<tr>
<td>Fortran:</td>
<td>Version 17.0.3.191 of Intel Fortran Compiler for Linux</td>
</tr>
<tr>
<td>C/C++:</td>
<td>Version 17.0.3.191 of Intel C/C++ Compiler for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

---

Continued on next page
# SPEC CFP2006 Result

**Dell Inc.**

PowerEdge R440 (Intel Xeon Gold 6152, 2.10 GHz)

**SPECfp2006** = 145

**SPECfp_base2006** = 138

**CPU2006 license**: 55  
**Test date**: Aug-2017

**Test sponsor**: Dell Inc.  
**Hardware Availability**: Sep-2017

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

**L3 Cache**: 30.25 MB I+D on chip per chip  
**Base Pointers**: 64-bit

**Other Cache**: None  
**Peak Pointers**: 32/64-bit

**Memory**: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)  
**Other Software**: None

**Disk Subsystem**: 1 x 1 TB SATA 7200 RPM  
**Other Hardware**: None

**Base Pointers**: 64-bit  
**Peak Pointers**: 32/64-bit

## 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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>15.4</td>
<td>880</td>
<td>15.4</td>
<td>882</td>
<td>15.4</td>
<td>881</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>398</td>
<td>49.2</td>
<td>398</td>
<td>49.2</td>
<td>398</td>
<td>49.2</td>
<td>372</td>
<td>52.7</td>
<td>371</td>
<td>52.8</td>
</tr>
<tr>
<td>433.milc</td>
<td>121</td>
<td>76.2</td>
<td>113</td>
<td>80.9</td>
<td>115</td>
<td>79.6</td>
<td>121</td>
<td>76.2</td>
<td>113</td>
<td>80.9</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>33.3</td>
<td>273</td>
<td>33.5</td>
<td>272</td>
<td>33.6</td>
<td>271</td>
<td>33.3</td>
<td>273</td>
<td>33.5</td>
<td>272</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>153</td>
<td>46.6</td>
<td>153</td>
<td>46.7</td>
<td>153</td>
<td>46.6</td>
<td>153</td>
<td>46.6</td>
<td>153</td>
<td>46.6</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>10.8</td>
<td>1110</td>
<td>10.6</td>
<td>1130</td>
<td>10.5</td>
<td>1140</td>
<td>10.8</td>
<td>1110</td>
<td>10.6</td>
<td>1130</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>20.2</td>
<td>464</td>
<td>20.4</td>
<td>462</td>
<td>20.4</td>
<td>461</td>
<td>20.2</td>
<td>464</td>
<td>20.4</td>
<td>462</td>
</tr>
<tr>
<td>444.namd</td>
<td>226</td>
<td>35.5</td>
<td>226</td>
<td>35.5</td>
<td>226</td>
<td>35.5</td>
<td>222</td>
<td>36.1</td>
<td>222</td>
<td>36.2</td>
</tr>
<tr>
<td>447.dealII</td>
<td>157</td>
<td>72.8</td>
<td>156</td>
<td>73.1</td>
<td>157</td>
<td>72.9</td>
<td>157</td>
<td>72.8</td>
<td>156</td>
<td>73.1</td>
</tr>
<tr>
<td>450.soplex</td>
<td>158</td>
<td>52.7</td>
<td>157</td>
<td>53.0</td>
<td>154</td>
<td>54.2</td>
<td>158</td>
<td>52.7</td>
<td>157</td>
<td>53.0</td>
</tr>
<tr>
<td>453.povray</td>
<td>76.5</td>
<td>69.6</td>
<td>75.6</td>
<td>70.4</td>
<td>76.3</td>
<td>69.8</td>
<td>65.9</td>
<td>80.7</td>
<td>67.4</td>
<td>78.9</td>
</tr>
<tr>
<td>454.calculix</td>
<td>116</td>
<td>71.1</td>
<td>116</td>
<td>71.0</td>
<td>116</td>
<td>71.0</td>
<td>108</td>
<td>76.5</td>
<td>108</td>
<td>76.4</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>39.8</td>
<td>266</td>
<td>40.1</td>
<td>265</td>
<td>40.5</td>
<td>262</td>
<td>34.0</td>
<td>312</td>
<td>34.1</td>
<td>311</td>
</tr>
<tr>
<td>465.tonto</td>
<td>212</td>
<td>46.5</td>
<td>212</td>
<td>46.3</td>
<td>212</td>
<td>46.5</td>
<td>144</td>
<td>68.2</td>
<td>144</td>
<td>68.3</td>
</tr>
<tr>
<td>470.lbm</td>
<td>10.2</td>
<td>1350</td>
<td>10.1</td>
<td>1360</td>
<td>10.1</td>
<td>1370</td>
<td>10.2</td>
<td>1350</td>
<td>10.1</td>
<td>1360</td>
</tr>
<tr>
<td>481.wrf</td>
<td>81.6</td>
<td>137</td>
<td>81.8</td>
<td>137</td>
<td>81.1</td>
<td>138</td>
<td>81.6</td>
<td>137</td>
<td>81.8</td>
<td>137</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>300</td>
<td>64.9</td>
<td>299</td>
<td>65.2</td>
<td>298</td>
<td>65.3</td>
<td>300</td>
<td>64.9</td>
<td>299</td>
<td>65.2</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

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
Dell Inc.

PowerEdge R440 (Intel Xeon Gold 6152, 2.10 GHz)

**SPECfp2006 =** 145  
**SPECfp_base2006 =** 138

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

---

**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-vw3y Wed Aug 2 23:06:54 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 6152 CPU @ 2.10GHz  
2 "physical id"s (chips)  
88 "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 : 22  
siblings : 44  
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28  
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28  
cache size : 30976 KB

From /proc/meminfo  
MemTotal: 196684112 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d  
SUSE Linux Enterprise Server 12 SP2

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"
Dell Inc.
PowerEdge R440 (Intel Xeon Gold 6152, 2.10 GHz)

SPECfp2006 = 145
SPECfp_base2006 = 138

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

Test date: Aug-2017
Hardware Availability: Sep-2017
Software Availability: Apr-2017

Platform Notes (Continued)

uname -a:
(946f6d7) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 2 18:40

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

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 923G 11G 912G 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. 0.4.2 07/21/2017
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/ia32:/root/cpu2006-1.2_ic17u3/lib/intel64:/root/cpu2006-1.2_ic17u3/sh10.2"
OMP_NUM_THREADS = "44"

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 R440 (Intel Xeon Gold 6152, 2.10 GHz)

SPECfp2006 = 145
SPECfp_base2006 = 138

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

Test date: Aug-2017
Hardware Availability: Sep-2017
Software Availability: Apr-2017

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
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: icc -m64
C++ benchmarks: icpc -m64
Fortran benchmarks: ifort -m64
Benchmarks using both Fortran and C: icc -m64 ifort -m64
**SPEC CFP2006 Result**

Dell Inc.  
PowerEdge R440 (Intel Xeon Gold 6152, 2.10 GHz)  

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 145</td>
<td>= 138</td>
</tr>
</tbody>
</table>

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

---

### 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-iipt2
  ```
- `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
  ```

---

Continued on next page
Dell Inc.  
PowerEdge R440 (Intel Xeon Gold 6152, 2.10 GHz)  
SPECfp2006 = 145  
SPECfp_base2006 = 138

CPU2006 license: 55  
Test date: Aug-2017  
Test sponsor: Dell Inc.  
Hardware Availability: Sep-2017  
Tested by: Dell Inc.  
Software Availability: Apr-2017

**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:


SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.  
Originally published on 19 September 2017.