## SPEC® CFP2006 Result

**Dell Inc.**

PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz)  

<table>
<thead>
<tr>
<th>SPECfp&lt;sup&gt;®&lt;/sup&gt;2006 =</th>
<th>93.3</th>
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</thead>
<tbody>
<tr>
<td>SPECfp&lt;sub&gt;base&lt;/sub&gt;2006 =</td>
<td>87.9</td>
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</tbody>
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### CPU2006 license: 55

<table>
<thead>
<tr>
<th>Test date:</th>
<th>Mar-2016</th>
</tr>
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<tbody>
<tr>
<td>Test sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

### Software Availability: Mar-2016

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2650L v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 2.50 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>1700</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>28 cores, 2 chips, 14 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>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>Red Hat Enterprise Linux Server release 7.2 (Maipo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
</tbody>
</table>

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**SPECfp<sup>®</sup>2006 = 93.3**  

**SPECfp<sub>base</sub>2006 = 87.9**
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz)

SPECfp2006 = 93.3
SPECfp_base2006 = 87.9

CPU2006 license: 55
Test sponsor: Dell Inc.
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L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 500 GB 7200 RPM SATA
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

<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>410.bwaves</td>
<td>26.1</td>
<td>52.1</td>
<td>25.2</td>
<td>53.9</td>
<td>25.0</td>
<td>54.4</td>
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<tr>
<td>416.gameess</td>
<td>837</td>
<td>23.4</td>
<td>840</td>
<td>23.3</td>
<td>842</td>
<td>23.3</td>
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<td>433.milc</td>
<td>148</td>
<td>62.0</td>
<td>148</td>
<td>61.9</td>
<td>150</td>
<td>61.3</td>
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<td>434.zeusmp</td>
<td>55.3</td>
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<tr>
<td>435.gromacs</td>
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<td>31.8</td>
<td>224</td>
<td>31.8</td>
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<tr>
<td>436.cactusADM</td>
<td>16.5</td>
<td>723</td>
<td>16.8</td>
<td>711</td>
<td>16.5</td>
<td>725</td>
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<tr>
<td>437.leslie3d</td>
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<td>287</td>
<td>31.8</td>
<td>296</td>
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<td>444.namd</td>
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<td>22.0</td>
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<td>22.0</td>
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<td>447.dealII</td>
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<tr>
<td>450.soplex</td>
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<td>39.1</td>
<td>210</td>
<td>39.8</td>
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<td>36.9</td>
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<td>453.povray</td>
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<td>41.1</td>
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<td>41.1</td>
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<td>454.calculix</td>
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<td>39.6</td>
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<td>39.7</td>
<td>209</td>
<td>39.5</td>
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<tr>
<td>459.GemsFDTD</td>
<td>47.7</td>
<td>222</td>
<td>49.6</td>
<td>214</td>
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<td>219</td>
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<td>465.tonto</td>
<td>349</td>
<td>28.2</td>
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<td>28.3</td>
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<td>28.3</td>
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<tr>
<td>470.lbm</td>
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<td>702</td>
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<td>765</td>
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<td>481.wrf</td>
<td>131</td>
<td>85.3</td>
<td>128</td>
<td>87.2</td>
<td>131</td>
<td>85.5</td>
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<tr>
<td>482.sphinx3</td>
<td>399</td>
<td>48.8</td>
<td>400</td>
<td>48.7</td>
<td>400</td>
<td>48.7</td>
</tr>
</tbody>
</table>

Operating System Notes
Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS settings:
Snoop Mode set to Opportunistic Snoop Broadcast
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Energy Efficient Turbo disabled
Memory Patrol Scrub disabled
Cstates autonomous/C1E enabled
Energy Efficient Policy set to Performance
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914

Continued on next page
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz) SPECfp2006 = 93.3
SPECfp_base2006 = 87.9

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

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667bSa285932ceab81e28219e1
running on localhost.localdomain Fri Mar 18 10:03:59 2016

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) CPU E5-2650L v4@ 1.70GHz
2 "physical id"s (chips)
56 "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 : 14
siblings : 28
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 35840 KB

From /proc/meminfo
MemTotal: 264040556 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

os-release:
NAME=“Red Hat Enterprise Linux Server"
VERSION=“7.2 (Maipo)"
ID=“rhel"
ID_LIKE=“fedora"
VERSION_ID=“7.2"
PRETTY_NAME=“Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR=“0;31"
CPE_NAME=“cpe:/o:redhat:enterprise_linux:7.2:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 18 03:18

SPEC is set to: /root/cpu2006-1.2

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 256G 12G 245G 5% /

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 Continued on next page
Dell Inc.  

PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz)  

SPECfp2006 = 93.3  
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Test date: Mar-2016  
Hardware Availability: Mar-2016  
Software Availability: Mar-2016  

Platform Notes (Continued)  

determined", but the intent may not be met, as there are frequent changes to 
hardware, firmware, and the "DMTF SMBIOS" standard.  

BIOS Dell Inc. 2.0.1 02/12/2016  
Memory:  
16x 002C0632002C 18ASF2G72PDZ-2G3B1 16 GB 2 rank 2400 MHz  
8x 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/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"  
OMP_NUM_THREADS = "28"  

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB  
memory using RedHat EL 7.1  
Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/transparent_hugepage/enabled  

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  

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  
436.cactusADM:  -DSPEC_CPU_LP64  
437.leslie3d:  -DSPEC_CPU_LP64  
444.namd:  -DSPEC_CPU_LP64  

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Dell Inc. PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz)

SPECfp2006 = 93.3
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Base Portability Flags (Continued)

447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemFDTD: -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 -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

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

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

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

Peak Portability Flags

Same as Base Portability Flags
Dell Inc.
PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz)

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Peak Optimization Flags

C benchmarks:

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

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
-auto-llp32

447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

Continued on next page
### Dell Inc.

**PowerEdge R630 (Intel Xeon E5-2650L v4, 1.70 GHz)**

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- **Hardware Availability:** Mar-2016
- **Software Availability:** Mar-2016

#### Peak Optimization Flags (Continued)

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

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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 other inquiries, please contact webmaster@spec.org.

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