## SPEC® CFP2006 Result

### Dell Inc.

**PowerEdge FC630 (Intel Xeon E5-2603 v4, 1.70 GHz)**

<table>
<thead>
<tr>
<th>Test Sponsor: Dell Inc.</th>
<th>Test Date: Jun-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 License: 55</td>
<td>Hardware Availability: Jun-2016</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Nov-2015</td>
</tr>
</tbody>
</table>

**SPECfp®2006 = 67.1**  
**SPECfp_base2006 = 65.4**

### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon E5-2603 v4</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td></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>12 cores, 2 chips, 6 cores/chip</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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Dell Inc.

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SPECfp2006 = 67.1
SPECfp_base2006 = 65.4

CPU2006 license: 55
Test date: Jun-2016
Test sponsor: Dell Inc.
Hardware Availability: Jun-2016
Tested by: Dell Inc.
Software Availability: Nov-2015
L3 Cache: 15 MB I+D on chip per chip
System State: Run level 3 (multi-user)
Other Cache: None
Base Pointers: 64-bit
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 1866 MHz)
Peak Pointers: 32/64-bit
Disk Subsystem: 1 x 250 GB 7200 RPM SATA HDD
Other Software: None
L3 Cache: Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 1866 MHz)
Disk Subsystem: 1 x 250 GB 7200 RPM SATA HDD
Other Hardware: None
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

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>
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<tbody>
<tr>
<td>410.bwaves</td>
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<td>347</td>
<td>39.2</td>
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<td>433.milc</td>
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<tr>
<td>434.zeusmp</td>
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<td>67.6</td>
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<td>30.7</td>
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<td>30.6</td>
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<td>436.cactusADM</td>
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<td>60.1</td>
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<td>32.5</td>
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<td>459.GemsFDTD</td>
<td>76.4</td>
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<td>71.7</td>
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<td>149</td>
<td>65.0</td>
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<td>465.tonto</td>
<td>363</td>
<td>27.1</td>
<td>364</td>
<td>27.1</td>
<td>363</td>
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<td>332</td>
<td>29.7</td>
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<tr>
<td>470.lbm</td>
<td>30.9</td>
<td>445</td>
<td>31.5</td>
<td>436</td>
<td>32.0</td>
<td>430</td>
<td>30.9</td>
<td>445</td>
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<tr>
<td>481.wrf</td>
<td>182</td>
<td>61.3</td>
<td>180</td>
<td>62.0</td>
<td>178</td>
<td>62.7</td>
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<td>61.3</td>
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<tr>
<td>482.sphinx3</td>
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<td>49.6</td>
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<td>49.5</td>
<td>393</td>
<td>49.6</td>
<td>393</td>
<td>49.6</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:
- Snoop Mode set to Home Snoop
- Virtualization Technology disabled
- System Profile set to custom
- CPU Power Management set to Maximum Performance
- C States set to Autonomous
- C1E disabled
- Uncore Frequency set to Dynamic
- Energy Efficiency Policy set to Performance
Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2603 v4, 1.70 GHz)

SPECfp2006 = 67.1
SPECfp_base2006 = 65.4

CPU2006 license: 55
Test date: Jun-2016
Test sponsor: Dell Inc.
Hardware Availability: Jun-2016
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Platform Notes (Continued)

Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

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 E5-2603 v4@ 1.70GHz
  2 "physical id"s (chips)
  12 "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 : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
  cache size : 15360 KB

From /proc/meminfo
  MemTotal:       528280412 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 Jun 22 00:27

  SPEC is set to: /root/cpu2006-1.2
  Filesystem    Type  Size  Used Avail Use% Mounted on
  /dev/sda2      xfs   230G  9.7G  220G   5% /

  Additional information from dmidecode:

Continued on next page
**SPEC CFP2006 Result**

Dell Inc.  
PowerEdge FC630 (Intel Xeon E5-2603 v4, 1.70 GHz)  

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**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. 2.2.1 06/07/2016  
Memory:  
16x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz, configured at 1866 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 = "12"  

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:  
cc  -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 -nofor_main

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Tested by: Dell Inc.  
Software Availability: Nov-2015

Base Portability Flags (Continued)

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  
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 -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
SPEC CFP2006 Result

Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2603 v4, 1.70 GHz)

SPECfp2006 =  67.1
SPECfp_base2006 =  65.4

CPU2006 license: 55
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Tested by:  Dell Inc.

Test date:  Jun-2016
Hardware Availability:  Jun-2016
Software Availability:  Nov-2015

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: -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-ilp32

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

Continued on next page
### Peak Optimization Flags (Continued)

465.tonto (continued):
- `-opt-malloc-options=3 -auto -unroll4`

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 -ansi-alias`
- `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: