Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

SPECfp®2006 = 120
SPECfp_base2006 = 114

Copyright 2006-2016 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

SPECfp®2006 = 120
SPECfp_base2006 = 114

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

Hardware

CPU Name: Intel Xeon E5-2690 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz: 2600
FPU: Integrated
CPU(s) enabled: 28 cores, 2 chips, 14 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: 256 KB I+D on chip per core

Operating System: Red Hat Enterprise Linux Server release 7.2 (Maipo)
Compiler: 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
Auto Parallel: Yes
File System: xfs

Software

Copyright 2006-2016 Standard Performance Evaluation Corporation

http://www.spec.org/
Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

SPECfp2006 = 120
SPECfp_base2006 = 114

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

L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 300 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>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>22.3</td>
<td>610</td>
<td>23.3</td>
<td>583</td>
<td>22.9</td>
<td>592</td>
<td>22.3</td>
<td>610</td>
<td>23.3</td>
<td>583</td>
<td>22.9</td>
<td>592</td>
<td>22.3</td>
<td>610</td>
<td>23.3</td>
<td>583</td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>518</td>
<td>37.8</td>
<td>521</td>
<td>37.6</td>
<td>516</td>
<td>38.0</td>
<td>421</td>
<td>46.5</td>
<td>420</td>
<td>46.6</td>
<td>421</td>
<td>46.5</td>
<td>144</td>
<td>10.6</td>
<td>144</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>146</td>
<td>62.8</td>
<td>143</td>
<td>64.3</td>
<td>126</td>
<td>73.1</td>
<td>146</td>
<td>62.8</td>
<td>143</td>
<td>64.3</td>
<td>126</td>
<td>73.1</td>
<td>45.0</td>
<td>30.2</td>
<td>45.0</td>
<td>30.2</td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>45.0</td>
<td>202</td>
<td>44.9</td>
<td>203</td>
<td>45.1</td>
<td>202</td>
<td>45.0</td>
<td>202</td>
<td>44.9</td>
<td>203</td>
<td>45.1</td>
<td>202</td>
<td>138</td>
<td>51.6</td>
<td>138</td>
<td>51.6</td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>138</td>
<td>51.6</td>
<td>141</td>
<td>50.8</td>
<td>137</td>
<td>52.2</td>
<td>138</td>
<td>51.6</td>
<td>141</td>
<td>50.8</td>
<td>138</td>
<td>52.2</td>
<td>433</td>
<td>30.3</td>
<td>433</td>
<td>30.3</td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>15.5</td>
<td>770</td>
<td>14.8</td>
<td>809</td>
<td>14.8</td>
<td>808</td>
<td>15.5</td>
<td>770</td>
<td>14.8</td>
<td>809</td>
<td>14.8</td>
<td>808</td>
<td>45.2</td>
<td>23.5</td>
<td>45.2</td>
<td>23.5</td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>30.6</td>
<td>307</td>
<td>26.5</td>
<td>354</td>
<td>29.2</td>
<td>322</td>
<td>30.6</td>
<td>307</td>
<td>26.5</td>
<td>354</td>
<td>29.2</td>
<td>322</td>
<td>222</td>
<td>44.3</td>
<td>222</td>
<td>44.3</td>
<td></td>
</tr>
<tr>
<td>444.namd</td>
<td>261</td>
<td>30.8</td>
<td>261</td>
<td>30.8</td>
<td>261</td>
<td>30.7</td>
<td>253</td>
<td>31.2</td>
<td>253</td>
<td>31.7</td>
<td>253</td>
<td>31.7</td>
<td>223</td>
<td>44.2</td>
<td>223</td>
<td>44.2</td>
<td></td>
</tr>
<tr>
<td>447.dealII</td>
<td>177</td>
<td>64.6</td>
<td>173</td>
<td>66.1</td>
<td>178</td>
<td>64.4</td>
<td>177</td>
<td>64.6</td>
<td>173</td>
<td>66.1</td>
<td>178</td>
<td>64.4</td>
<td>177</td>
<td>64.6</td>
<td>177</td>
<td>64.6</td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>181</td>
<td>46.2</td>
<td>176</td>
<td>47.3</td>
<td>182</td>
<td>45.8</td>
<td>181</td>
<td>46.2</td>
<td>176</td>
<td>47.3</td>
<td>182</td>
<td>45.8</td>
<td>85.3</td>
<td>24.1</td>
<td>85.3</td>
<td>24.1</td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>85.3</td>
<td>62.4</td>
<td>84.9</td>
<td>62.7</td>
<td>85.0</td>
<td>62.6</td>
<td>73.7</td>
<td>72.2</td>
<td>74.8</td>
<td>71.1</td>
<td>75.5</td>
<td>70.5</td>
<td>45.2</td>
<td>23.5</td>
<td>45.2</td>
<td>23.5</td>
<td></td>
</tr>
<tr>
<td>454.calculix</td>
<td>150</td>
<td>55.0</td>
<td>150</td>
<td>55.0</td>
<td>150</td>
<td>54.9</td>
<td>138</td>
<td>59.9</td>
<td>143</td>
<td>57.5</td>
<td>140</td>
<td>59.1</td>
<td>150</td>
<td>55.0</td>
<td>150</td>
<td>55.0</td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>45.2</td>
<td>235</td>
<td>45.2</td>
<td>235</td>
<td>48.7</td>
<td>218</td>
<td>37.8</td>
<td>281</td>
<td>39.4</td>
<td>269</td>
<td>37.8</td>
<td>281</td>
<td>222</td>
<td>44.3</td>
<td>222</td>
<td>44.3</td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>165</td>
<td>832</td>
<td>16.8</td>
<td>817</td>
<td>16.6</td>
<td>827</td>
<td>16.5</td>
<td>832</td>
<td>16.8</td>
<td>817</td>
<td>16.6</td>
<td>827</td>
<td>16.5</td>
<td>832</td>
<td>16.5</td>
<td>832</td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>95.3</td>
<td>117</td>
<td>96.5</td>
<td>116</td>
<td>96.3</td>
<td>116</td>
<td>95.3</td>
<td>117</td>
<td>96.5</td>
<td>116</td>
<td>96.3</td>
<td>116</td>
<td>95.3</td>
<td>117</td>
<td>95.3</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>256</td>
<td>76.2</td>
<td>266</td>
<td>76.3</td>
<td>253</td>
<td>77.0</td>
<td>256</td>
<td>76.2</td>
<td>256</td>
<td>76.2</td>
<td>253</td>
<td>77.0</td>
<td>256</td>
<td>76.2</td>
<td>256</td>
<td>76.2</td>
<td></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
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 FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)  

**SPECfp2006 = 120**  
**SPECfp_base2006 = 114**

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

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

---

**Platform Notes (Continued)**

Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.revl4
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Sun Jul 17 20:35:16 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 E5-2690 v4@ 2.60GHz
  2 "physical id"s (chips)
  56 "processors"
core, 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:       263908276 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 Jul 17 15:40

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

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs  276G  11G  266G   4% /
```

Additional information from dmidecode:

Continued on next page
**SPEC CFP2006 Result**

Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

**SPECfp2006 = 120**

**SPECfp_base2006 = 114**

CPU2006 license: 55
Test date: Jul-2016
Test sponsor: Dell Inc.
Hardware Availability: Jun-2016
Tested by: Dell Inc.
Software Availability: Nov-2015

### 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:
- 8x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz
- 16x 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 -nofor_main
- 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main

Continued on next page
Spec CFP2006 Result

Dell Inc. PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

SPECfp2006 = 120
SPECfp_base2006 = 114

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

CPU2006 license: 55
Test date: Jul-2016
Hardware Availability: Jun-2016
Software Availability: Nov-2015

Base Portability Flags (Continued)

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 -03 -no-prec-div -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -03 -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
Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

SPECfp2006 = 120
SPECfp_base2006 = 114

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

Test date: Jul-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
## Dell Inc.

PowerEdge FC630 (Intel Xeon E5-2690 v4, 2.60 GHz)

### SPEC CFP2006 Result

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>114</td>
</tr>
</tbody>
</table>

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

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

### 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:


---

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 23 August 2016.