### SPEC® CFP2006 Result

**Dell Inc.**

PowerEdge FC830 (Intel Xeon E5-4610 v3, 1.70 GHz)  

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 67.7</td>
<td>= 64.9</td>
</tr>
</tbody>
</table>

- **CPU2006 license:** 55  
- **Test sponsor:** Dell Inc.  
- **Tested by:** Dell Inc.  
- **Test date:** Jan-2015  
- **Hardware Availability:** Jun-2015  
- **Software Availability:** Jun-2015

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tr>
<td>416.gamess</td>
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<tr>
<td>433.milc</td>
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<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
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<tr>
<td>435.gromacs</td>
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<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
<td>450</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td></td>
<td>159</td>
</tr>
<tr>
<td>444.namd</td>
<td>14.8</td>
<td>14.4</td>
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<tr>
<td>447.dealII</td>
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<td>28.7</td>
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<tr>
<td>450.soplex</td>
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<td>25.4</td>
</tr>
<tr>
<td>453.povray</td>
<td>32.1</td>
<td>28.7</td>
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<tr>
<td>454.calculix</td>
<td></td>
<td>29.0</td>
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<tr>
<td>459.GemsFDTD</td>
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<td>27.1</td>
</tr>
<tr>
<td>465.tonto</td>
<td></td>
<td>26.8</td>
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<tr>
<td>470.lbm</td>
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<td>21.3</td>
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<tr>
<td>481.wrf</td>
<td></td>
<td>152</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td></td>
<td>40.3</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon E5-4610 v3  
- **CPU Characteristics:**  
  - CPU MHz: 1700  
  - FPU: Integrated  
  - CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core  
  - CPU(s) orderable: 4 chip  
  - Primary Cache: 32 KB I + 32 KB D on chip per core  
  - Secondary Cache: 256 KB I+D on chip per core

**Software**

- **Operating System:** SUSE Linux Enterprise Server 12 3.12.28-4-default
- **Compiler:** C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;  
  Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
- **Auto Parallel:** Yes  
- **File System:** ext4  
- **System State:** Run level 3 (multi-user)

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<table>
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<tr>
<th>Benchmark</th>
<th>Seconds Base</th>
<th>Ratio Base</th>
<th>Seconds Peak</th>
<th>Ratio Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>bwaves</td>
<td>21.5</td>
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<td>22.4</td>
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<tr>
<td>gamess</td>
<td><strong>949</strong></td>
<td><strong>20.6</strong></td>
<td>955</td>
<td>20.5</td>
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<td>zeusmp</td>
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<td>gromacs</td>
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<td>300</td>
<td>23.8</td>
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<td>cactusADM</td>
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<td>450</td>
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<td>leslie3d</td>
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<td>159</td>
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<tr>
<td>namd</td>
<td><strong>558</strong></td>
<td><strong>14.4</strong></td>
<td>559</td>
<td>14.3</td>
</tr>
<tr>
<td>dealII</td>
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<td>28.6</td>
<td>398</td>
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<td>soplex</td>
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<td>povray</td>
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<td>calculix</td>
<td><strong>305</strong></td>
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<td>27.0</td>
</tr>
<tr>
<td>GemsFDTD</td>
<td><strong>70.0</strong></td>
<td><strong>152</strong></td>
<td>66.9</td>
<td>159</td>
</tr>
<tr>
<td>tonto</td>
<td>447</td>
<td>22.0</td>
<td>463</td>
<td>21.3</td>
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<tr>
<td>ibm</td>
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<td>wrf</td>
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<tr>
<td>sphinx3</td>
<td><strong>488</strong></td>
<td><strong>40.2</strong></td>
<td>486</td>
<td>40.1</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:
  - Snoop Mode set to Home Snoop
  - Virtualization Technology disabled
  - System Profile set to Performance
- Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
- $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fb8667b5a285932ceab81e28219e1
- running on linux-k8qh Sat Jan 31 06:03:55 2015

This section contains SUT (System Under Test) info as seen by

Continued on next page
SPEC CFP2006 Result

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Platform Notes (Continued)

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 E5-4610 v3 @ 1.70GHz
4 "physical id"s (chips)
80 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
physical 2: cores 0 1 2 3 4 8 9 10 11 12
physical 3: cores 0 1 2 3 4 8 9 10 11 12
cache size : 25600 KB

From /proc/meminfo
MemTotal: 529334376 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 0
# 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"
VERSION_ID="12"
PRETTY_NAME="SUSE Linux Enterprise Server 12"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12"

uname -a:
Linux linux-k8qh 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
(9879bd4) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 30 20:04

SPEC is set to: /root/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext4 267G 13G 253G 5% /

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**Platform Notes (Continued)**

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. 0.4.0 01/08/2015

Memory:
- 4x 002C00B30002C 36ASF2G72PZ-2G1A1 16 GB 2 rank 2133 MHz, configured at 1600 MHz
- 1x 00AD00B3000AD HMA42GR7MFR4N-TFTD 16 GB 2 rank 2133 MHz, configured at 1600 MHz
- 14x 00AD063200AD HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600 MHz
- 5x 00AD063200AD HMA42GR7MFR4N-TFT1 16 GB 2 rank 2133 MHz, configured at 1600 MHz
- 8x 00CE00B300CE M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 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 = "40"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

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
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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
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.GemsFDTS: -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:
icc -m64

Fortran benchmarks:
ifort -m64

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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```
icc  -m64 ifort -m64
```

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel
```

C++ benchmarks:

```
444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

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

Fortran benchmarks:

```
410.bwaves: basepeak = yes
416.gamess: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -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(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -opt-prefetch -parallel
```

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Peak Optimization Flags (Continued)

465.tonto: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-inline-calloc -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 -03 -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
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revE.20150421.xml

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For other inquiries, please contact webmaster@spec.org.

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