## SPEC® CFP2006 Result

**Dell Inc.**

**PowerEdge R730 (Intel Xeon E5-2637 v4, 3.50 GHz)**

**SPECfp®2006** = 107  
**SPECfp_base2006** = 104

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Dell Inc.</th>
<th>Hardware Availability</th>
<th>Mar-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by</td>
<td>Dell Inc.</td>
<td>Software Availability</td>
<td>Mar-2016</td>
</tr>
<tr>
<td>CPU2006 license</td>
<td>55</td>
<td>Test date</td>
<td>Dec-2015</td>
</tr>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-2637 v4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU MHZ</td>
<td>3500</td>
<td></td>
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<tr>
<td>FPU</td>
<td>Integrated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>8 cores, 2 chips, 4 cores/chip, 2 threads/core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
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</tbody>
</table>

### Software

- Operating System: Red Hat Enterprise Linux Server release 7.1 (Maipo)  
  3.10.0-229.el7.x86_64
- 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

### Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Benchmark Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
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<td>410.bwaves</td>
<td></td>
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<tr>
<td>416.gamess</td>
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<td>435.gromacs</td>
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<td>436.cactusADM</td>
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<td>437.leslie3d</td>
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<td>444.namd</td>
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<tr>
<td>447.dealII</td>
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<td>453.povray</td>
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<td>459.GemsFDTD</td>
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<td>465.tonto</td>
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<tr>
<td>470.lbm</td>
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<td>52.4</td>
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<tr>
<td>481.wrf</td>
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<tr>
<td>482.sphinx3</td>
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**SPECfp_base2006** = 104  
**SPECfp2006** = 107  
**SPECfp2006** = 107
Dell Inc.

PowerEdge R730 (Intel Xeon E5-2637 v4, 3.50 GHz)

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

L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 120 GB SATA SSD
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>
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<td>215</td>
<td>90.7</td>
<td>216</td>
<td>90.4</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 Opportunistic Snoop Broadcast
Virtualization Technology disabled
System Profile set to Performance
Memory Patrol Scrub disabled
C1E/Cstates enabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb86675a285932ceab81e28219e1
running on localhost.localdomain Tue Dec  1 22:05:51 2015

Continued on next page
Platform Notes (Continued)

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 E5-2637 v4@ 3.50GHz
  2 "physical id"s (chips)
  16 "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 : 4
  siblings : 8
  physical 0: cores 0 1 2 3
  physical 1: cores 0 1 2 3
cache size : 15360 KB

From /proc/meminfo
MemTotal:       528283084 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux Server"
VERSION="7.1 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.1"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-229.e17.x86_64 #1 SMP Thu Jan 29 18:37:38 EST 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 1 17:21

SPEC is set to: /root/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 102G 8.7G 93G 9% /

Additional information from dmdidecode:

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.

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### Dell Inc.

**PowerEdge R730 (Intel Xeon E5-2637 v4, 3.50 GHz)**

| SPECfp2006 = | 107 |
| SPECfp_base2006 = | 104 |

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

**Test date:** Dec-2015

**Hardware Availability:** Mar-2016

**Software Availability:** Mar-2016

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**Platform Notes (Continued)**

- BIOS Dell Inc. 1.7.10 11/20/2015
- Memory:
  - 16x 00CE00B300CE M393A4K40BB1-CRC 32 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 = "8"

- 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
- 436.gromacs: -DSPEC_CPU_LP64 -nofor_main
- 437.cactusADM: -DSPEC_CPU_LP64 -nofor_main
- 443.leslie3d: -DSPEC_CPU_LP64
- 444.namd: -DSPEC_CPU_LP64
- 447.dealII: -DSPEC_CPU_LP64
- 450.soplex: -DSPEC_CPU_LP64
- 453.povray: -DSPEC_CPU_LP64

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SPEC CFP2006 Result

Dell Inc.
PowerEdge R730 (Intel Xeon E5-2637 v4, 3.50 GHz)

SPECfp2006 = 107
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CPU2006 license: 55
Test sponsor: Dell Inc.
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Base Portability Flags (Continued)

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 -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 R730 (Intel Xeon E5-2637 v4, 3.50 GHz)

SPECfp2006 = 107
SPECfp_base2006 = 104

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

Test date: Dec-2015
Hardware Availability: Mar-2016
Software Availability: Mar-2016

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphnx3: 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
### Peak Optimization Flags (Continued)

- **435.gromacs**: basepeak = yes
- **436.cactusADM**: basepeak = yes
- **454.calculix**: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-llp32 -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:


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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 5 April 2016.