Dell Inc.

PowerEdge R730 (Intel Xeon E5-2697 v4, 2.30 GHz)

**SPECfp®2006** = 121

**SPECfp_base2006** = 114

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<tr>
<th>Benchmark</th>
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<th>SPECfp_base2006</th>
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<tr>
<td>410.bwaves</td>
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<tr>
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<tr>
<td>437.leslie3d</td>
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<td>481.wrf</td>
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</tr>
<tr>
<td>482.sphinx3</td>
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</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon E5-2697 v4
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.60 GHz
- **CPU MHz:** 2300
- **FPU:** Integrated
- **CPU(s) enabled:** 36 cores, 2 chips, 18 cores/chip, 2 threads/core
- **CPU(s) orderable:** 1,2 chip
- **Primary Cache:** 32 KB L + 32 KB D on chip per core
- **Secondary Cache:** 256 KB L+D on chip per core

**Software**

- **Operating System:** Red Hat Enterprise Linux Server release 7.1 (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
## SPEC CFP2006 Result

**Dell Inc.**

PowerEdge R730 (Intel Xeon E5-2697 v4, 2.30 GHz)

**SPECfp2006 =** 121

**SPECfp_base2006 =** 114

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

*Other Cache:* None  
*Memory:* 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)  
*Disk Subsystem:* 1 x 160 GB SATA SSD  
*Other Hardware:* None

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>275</td>
<td>71.0</td>
<td>70.8</td>
<td>273</td>
</tr>
</tbody>
</table>

### Operating System Notes

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Platform Notes

**BIOS settings:**
- Snoop Mode set to Opportunistic Snoop Broadcast
- Virtualization Technology disabled
- System Profile set to Performance
- Memory Patrol Scrub disabled
- Cstates/C1E enabled
- Sysinfo program /root/cpu2006-1.2/config/sysinfo_rev6914
  - $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

Continued on next page
Dell Inc.  

PowerEdge R730 (Intel Xeon E5-2697 v4, 2.30 GHz)  

SPECfp2006 = 121  
SPECfp_base2006 = 114

CPU2006 license: 55  
Test sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test date: Oct-2015  
Hardware Availability: Mar-2016  
Software Availability: Mar-2016

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 E5-2697 v4 @ 2.30GHz  
2 "physical id"s (chips)  
72 "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 : 18  
siblings : 36  
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27  
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27  
cache size : 46080 KB

From /proc/meminfo

MemTotal:       528283000 kB  
HugePages_Total:       0  
Hugepagesize:       2048 kB

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

os-release:  
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.el7.x86_64 #1 SMP Thu Jan 29 18:37:38 EST 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 29 15:52

SPEC is set to: /root/cpu2006-1.2

Filesystem  Type  Size  Used Avail Use%  Mounted on
/dev/sda2  xfs  131G  8.6G  122G  7%  /

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.

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SPEC CFP2006 Result

Dell Inc.

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Platform Notes (Continued)

BIOS Dell Inc. 1.7.8 10/19/2015
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 = "36"

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
  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

Continued on next page
# SPEC CFP2006 Result

## Dell Inc.

PowerEdge R730 (Intel Xeon E5-2697 v4, 2.30 GHz)

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**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Oct-2015  
**Hardware Availability:** Mar-2016  
**Software Availability:** Mar-2016

### 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 E5-2697 v4, 2.30 GHz)  

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CPU2006 license: 55  
Test sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test date: Oct-2015  
Hardware Availability: Mar-2016  
Software Availability: Mar-2016

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 R730 (Intel Xeon E5-2697 v4, 2.30 GHz)  

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<td>Dell Inc.</td>
<td>Software Availability:</td>
<td>Mar-2016</td>
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</table>

**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

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html  

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml  
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.xml

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