## SPEC® CFP2006 Result

Dell Inc.  
PowerEdge R930 (Intel Xeon E7-8891 v4, 2.80 GHz)  

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp(^{\circledast})2006</th>
<th>SPECfp(_{\text{base}2006})</th>
</tr>
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<tbody>
<tr>
<td>410.bwaves</td>
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<tr>
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**SPECfp\(^{\circledast}\)2006 = 131**  
**SPECfp\(_{\text{base}2006}\) = 125**

### Hardware

- **CPU Name:** Intel Xeon E7-8891 v4  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.50 GHz  
- **CPU MHz:** 2800  
- **FPU:** Integrated  
- **CPU(s) enabled:** 40 cores, 4 chips, 10 cores/chip, 2 threads/core  
- **CPU(s) orderable:** 2,4 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 SP1 3.12.49-11-default  
- **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  
- **System State:** Run level 3 (multi-user)  

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info@spec.org  
http://www.spec.org/
Dell Inc.  
PowerEdge R930 (Intel Xeon E7-8891 v4, 2.80 GHz)

SPECfp2006 = 131  
SPECfp_base2006 = 125

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

<table>
<thead>
<tr>
<th>L3 Cache: 60 MB I+D on chip per chip</th>
<th>Base Pointers: 64-bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Cache: None</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)</td>
<td>Other Software: None</td>
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<tr>
<td>Disk Subsystem: 1 x 400 GB SAS6 SSD</td>
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<td>Other Hardware: None</td>
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Results Table

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</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:
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Hardware P States
Memory Frequency set to Maximum Performance
Turbo Boost enabled
Energy Efficient Turbo enabled
C1E disabled
C States set to Autonomous

Continued on next page
SPEC CFP2006 Result

Dell Inc.

PowerEdge R930 (Intel Xeon E7-8891 v4, 2.80 GHz)

SPECfp2006 = 131
SPECfp_base2006 = 125

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

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

Platform Notes (Continued)

Collaborative CPU Performance Control disabled
Memory Patrol Scrub disabled
Memory Refresh Rate set to 1x
Uncore Frequency set to Dynamic
Energy Efficient Policy set to Performance
Monitor/MMWait enabled
Snoop Mode set to Home Snoop
Sysinfo program /root/ic16_0_Sept12_2015/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 E7-8891 v4 @ 2.80GHz
  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 5 9 10 11 13 18 24 26 28 29
    physical 1: cores 5 9 10 11 13 18 24 26 28 29
    physical 2: cores 5 9 10 11 13 18 24 26 28 29
    physical 3: cores 5 9 10 11 13 18 24 26 28 29
  cache size : 61440 KB

From /proc/meminfo
  MemTotal: 529318708 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP1

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 1
    # 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-SP1"
    VERSION_ID="12.1"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
    ID="sles"

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**Platform Notes (Continued)**

ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:
    (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 4 08:37

SPEC is set to: /root/ic16.0_Sept12_2015

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   368G  8.1G  360G   3% /

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. 2.0.1 04/20/2016

Memory:
    32x 00AD00B300AD HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1600
    MHz
    64x 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"
OMP_NUM_THREADS = "40"

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

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Base Compiler Invocation (Continued)

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
- 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

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**Dell Inc.**

**PowerEdge R930 (Intel Xeon E7-8891 v4, 2.80 GHz)**

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### Peak Compiler Invocation (Continued)

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

### 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:threadsafepass1  
  -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:threadsafepass1  
  -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:threadsafepass1  
  -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-  
  Continued on next page
Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafepass 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:threadsafepass 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:

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
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

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

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