### Dell Inc.

**PowerEdge R930 (Intel Xeon E7-8855 v4, 2.10 GHz)**

**SPECfp®2006 =** 106  
**SPECfp_base2006 =** 101

<table>
<thead>
<tr>
<th>SPECfpl 살해</th>
<th>SPECfp_base 살해</th>
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<tbody>
<tr>
<td>410.bwaves</td>
<td>871</td>
</tr>
<tr>
<td>416.gamess</td>
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<td>101</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>63.8</td>
</tr>
</tbody>
</table>

**SPECfp_base2006 = 101**

### Hardware

- **CPU Name:** Intel Xeon E7-8855 v4  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 2.80 GHz  
- **CPU MHz:** 2100  
- **FPU:** Integrated  
- **CPU(s) enabled:** 56 cores, 4 chips, 14 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)
Dell Inc.  
PowerEdge R930 (Intel Xeon E7-8855 v4, 2.10 GHz)  

SPEC CFP2006 Result  

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: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1333 MHz)  
Disk Subsystem: 1 x 480 GB SAS SSD  
Other Hardware: None  

Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: None  

Results Table  

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds Base</th>
<th>Ratio Base</th>
<th>Seconds Peak</th>
<th>Ratio Peak</th>
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<tbody>
<tr>
<td>410.bwaves</td>
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<td>481.wrf</td>
<td>112</td>
<td>100</td>
<td>110</td>
<td>101</td>
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<td>482.sphinx3</td>
<td>304</td>
<td>64.2</td>
<td>306</td>
<td>63.8</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:  
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 E7-8855 v4, 2.10 GHz)  

**SPECfp2006 =** 106  
**SPECfp_base2006 =** 101

<table>
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<tr>
<th>CPU2006 license: 55</th>
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**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/MWait Enabled  
Snoop Mode set to Home Snoop  
Sysinfo program /root/ic16.0_Sept12_2015/config/sysinfo.rev6914  
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab8e28219e1  
running on bdx-perfspeed Thu May 5 20:34:22 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 E7-8855 v4 @ 2.10GHz  
    4 "physical id"s (chips)  
    112 "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 : 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  
    physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14  
    physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14  
    cache size : 35840 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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## Dell Inc.

**PowerEdge R930 (Intel Xeon E7-8855 v4, 2.10 GHz)**

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### Platform Notes (Continued)

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

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

```bash
run-level 3 May 5 14:37
SPEC is set to: /root/ic16.0_Sept12_2015
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 368G 9.0G 359G 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 SM BIOS" standard.

**BIOS:** Dell Inc. 2.0.1 04/20/2016

**Memory:**
- 32x 00AD00B300AD HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz, configured at 1333 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 = "56"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

```bash
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

### Base Compiler Invocation

**C benchmarks:**
- icc -m64

**C++ benchmarks:**
- icpc -m64

**Fortran benchmarks:**
- ifort -m64

Continued on next page
Dell Inc.  
PowerEdge R930 (Intel Xeon E7-8855 v4, 2.10 GHz)  

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

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 E7-8855 v4, 2.10 GHz)  

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Test sponsor: Dell Inc.  
Test date: May-2016  
Tested by: Dell Inc.  
Hardware Availability: Jun-2016  
Software Availability: Dec-2015

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: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-

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**Peak Optimization Flags (Continued)**

434.zeusmp: basepeak = yes  
437.leslie3d: basepeak = yes  
459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
                      -ipo(pass 2) -03(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) -03(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 -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-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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For other inquiries, please contact webmaster@spec.org.  

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