### SPEC® CFP2006 Result

**Dell Inc.**

PowerEdge R930 (Intel Xeon E7-8893 v4, 3.20 GHz)

**SPECfp®2006 = 118**

**SPECfp_base2006 = 113**

**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Hardware Availability:** Jun-2016

**Software Availability:** Dec-2015

**Test date:** May-2016

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**CPU Name:** Intel Xeon E7-8893 v4

**CPU Characteristics:** Intel Turbo Boost Technology up to 3.50 GHz

**CPU MHz:** 3200

**FPU:** Integrated

**CPU(s) enabled:** 16 cores, 4 chips, 4 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

---

**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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<table>
<thead>
<tr>
<th>SPEC Benchmark</th>
<th>SPECfp Base2006</th>
<th>SPECfp Base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>bwaves</td>
<td></td>
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<td>leslie3d</td>
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</table>

**SPECfp Base2006 = 113**

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Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/

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L3 Cache: 60 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 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</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>80.1</td>
<td>245</td>
<td>79.4</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:
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
Dell Inc.

PowerEdge R930 (Intel Xeon E7-8893 v4, 3.20 GHz)  

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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 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1  
runtime on bdx-perfspeed Fri May 6 14:28:02 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 E7-8893 v4 @ 3.20GHz  
4 "physical id"s (chips)  
32 "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 12 13 25 26  
physical 1: cores 12 13 25 26  
physical 2: cores 12 13 25 26  
physical 3: cores 12 13 25 26  
cache size : 61440 KB

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

From /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"

Continued on next page
**SPEC CFP2006 Result**

**Dell Inc.**

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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 6 09:38

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 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 = "16"
```

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
```

Continued on next page
Dell Inc. PowerEdge R930 (Intel Xeon E7-8893 v4, 3.20 GHz)

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### Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

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

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>-DSPEC_CPU_LP64</td>
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<tr>
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<td>-DSPEC_CPU_LP64 -nofor_main</td>
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<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>470.lbm</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>481.wrf</td>
<td>-DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>-DSPEC_CPU_LP64</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

- **C benchmarks:**
  ```bash
  -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
  -ansi-alias
  ```

- **C++ benchmarks:**
  ```bash
  -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
  ```

- **Fortran benchmarks:**
  ```bash
  -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
  ```

- **Benchmarks using both Fortran and C:**
  ```bash
  -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
  -ansi-alias
  ```

### Peak Compiler Invocation

- **C benchmarks:**
  ```bash
  icc  -m64
  ```

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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: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-

Continued on next page
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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) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inplace-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:

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
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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