Dell Inc.

PowerEdge R930 (Intel Xeon E7-8890 v4, 2.20 GHz)

**SPECint®2006 = 69.1**

**SPECint_base2006 = 67.5**

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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**Hardware**

- **CPU Name:** Intel Xeon E7-8890 v4
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.40 GHz
- **CPU MHz:** 2200
- **FPU:** Integrated
- **CPU(s) enabled:** 96 cores, 4 chips, 24 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
- **L3 Cache:** 60 MB I+D on chip per core
- **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

---

**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
- **Auto Parallel:** Yes
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 32/64-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** Microquill SmartHeap V10.2
SPEC CINT2006 Result

Dell Inc.
PowerEdge R930 (Intel Xeon E7-8890 v4, 2.20 GHz)

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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbnc</td>
<td>249</td>
<td>39.3</td>
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<td>39.2</td>
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<tr>
<td>429.mcf</td>
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<td>471.omnetpp</td>
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<td>473.astar</td>
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<td>35.3</td>
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<td>35.2</td>
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<td>35.2</td>
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<tr>
<td>483.xalancbmk</td>
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<td>69.0</td>
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<td>97.1</td>
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<td>77.5</td>
<td>88.4</td>
<td>78.0</td>
<td>87.9</td>
<td>78.5</td>
</tr>
</tbody>
</table>

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

Submit Notes

The config file option 'submit' was used.

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
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
running on bdx-perf01 Thu May  5 14:41:26 2016
Continued on next page
**Dell Inc.**

**PowerEdge R930 (Intel Xeon E7-8890 v4, 2.20 GHz)\(^{1}\)**

<table>
<thead>
<tr>
<th>Test sponsor:</th>
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**SPECint2006 Result**

- **SPECint2006** = 69.1
- **SPECint_base2006** = 67.5

**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`

```plaintext
model name : Intel(R) Xeon(R) CPU E7-8890 v4 @ 2.20GHz
4 "physical id"s (chips)
192 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
cache size : 61440 KB
```

From `/proc/meminfo`

```plaintext
MemTotal:       529322532 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

/shr/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:

```plaintext
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

uname -a:

```
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

Continued on next page
SPEC CINT2006 Result

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Platform Notes (Continued)

run-level 3 May 5 14:21
SPEC is set to: /root/ic16.0_Sept12_2015
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 368G 9.7G 358G 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,scatter"
OMP_NUM_THREADS = "96"

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

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64

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## Base Portability Flags (Continued)

- 429.mcf: `-DSPEC_CPU_LP64`
- 445.gobmk: `-DSPEC_CPU_LP64`
- 456.hmmer: `-DSPEC_CPU_LP64`
- 458.sjeng: `-DSPEC_CPU_LP64`
- 462.libquantum: `-DSPEC_CPU_LP64` `-DSPEC_CPU_LINUX`
- 464.h264ref: `-DSPEC_CPU_LP64`
- 471.omnetpp: `-DSPEC_CPU_LP64`
- 473.astar: `-DSPEC_CPU_LP64`
- 483.xalancbmk: `-DSPEC_CPU_LP64` `-DSPEC_CPU_LINUX`

## Base Optimization Flags

**C benchmarks:**

- `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-parallel` `-opt-prefetch` `-auto-p32`

**C++ benchmarks:**

- `-xCORE-AVX2` `-ipo` `-O3` `-no-prec-div` `-opt-prefetch` `-auto-p32`
- `-Wl,-z,muldefs` `-L/sh` `-lsmartheap64`

## Base Other Flags

**C benchmarks:**

- 403.gcc: `-Dalloca=_alloca`

## Peak Compiler Invocation

**C benchmarks (except as noted below):**

- `icc` `-m64`

- 400.perlbench: `icc` `-m32` `-L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

**C++ benchmarks (except as noted below):**

- `icpc` `-m32` `-L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`
- 473.astar: `icpc` `-m64`

## Peak Portability Flags

- 400.perlbench: `-D_FILE_OFFSET_BITS=64` `-DSPEC_CPU_LINUX_IA32`
- 401.bzip2: `-DSPEC_CPU_LP64`
Peak Portability Flags (Continued)

403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -D_FILE_OFFSET_BITS=64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -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) -opt-prefetch
   -ansi-alias

401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
   -ipo(pass 2) -O3(pass 2) -no-prec-div
   -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32
   -opt-prefetch -ansi-alias

403.gcc: basepeak = yes

429.mcf: -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel
   -opt-prefetch -auto-p32

445.gobmk: basepeak = yes

456.hmmer: basepeak = yes

458.sjeng: -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) -unroll14

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -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)
   -opt-ra-region-strategy=block
   -ansi-alias
   -Wl,-z,muldefs -L/sh -lsmartheap

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Peak Optimization Flags (Continued)

473.astar: basepeak = yes

483.xalancbmk: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

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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