### Dell Inc.

**PowerEdge R930 (Intel Xeon E7-8880 v4, 2.20 GHz)**

**SPECint®2006 =** 68.1  
**SPECint_base2006 =** 65.9

**CPU2006 license:** 55  
**Test date:** May-2016  
**Hardware Availability:** Jun-2016

**Test sponsor:** Dell Inc.  
**Hardware Availability:** Dec-2015  
**Tested by:** Dell Inc.

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#### 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

#### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E7-8880 v4</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.30 GHz</td>
</tr>
<tr>
<td>CPU MHZ</td>
<td>2200</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>88 cores, 4 chips, 22 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>2,4 chip</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>55 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x 480 GB SAS SSD</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
</tr>
</tbody>
</table>

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## Benchmarks

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>42.1</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>38.4</td>
</tr>
<tr>
<td>403.gcc</td>
<td>23.4</td>
</tr>
<tr>
<td>429.mcf</td>
<td>35.5</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>54.8</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>89.4</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>33.0</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>32.6</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>53.7</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>53.7</td>
</tr>
<tr>
<td>473.astar</td>
<td>46.3</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>80.3</td>
</tr>
</tbody>
</table>

**SPECint®2006 =** 68.1  
**SPECint_base2006 =** 65.9
Dell Inc.

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SPECint2006 = 68.1
SPECint_base2006 = 65.9

Benchmark	Base	Peak
400.perlbench	255 38.4 254 38.5 255 38.4 232 42.1 232 42.1 232 42.1
401.bzip2	414 23.3 414 23.3 415 23.3 411 23.5 412 23.4 412 23.4
403.gcc	226 35.6 226 35.6 226 35.7 226 35.6 226 35.6 226 35.7
429.mcf	161 56.5 172 53.1 166 54.8 163 56.0 164 55.5 164 55.5
456.hmmer	116 80.4 116 80.1 116 80.5 116 80.4 116 80.1 116 80.5
458.sjeng	371 32.6 371 32.6 371 32.6 367 33.0 367 33.0 367 33.0
462.libquantum	2.42 8550 2.37 8750 2.40 8640 2.42 8550 2.37 8750 2.40 8640
464.h264ref	412 53.7 412 53.4 412 53.7 412 53.7 412 53.7 414 53.4
471.omnetpp	130 48.2 135 46.3 139 44.8 116 53.7 116 53.7 116 53.7
473.astar	206 34.1 208 33.7 205 34.2 205 34.2 205 34.2 205 34.2
483.xalancbmk	96.5 71.5 99.7 69.2 97.3 70.9 85.9 80.3 86.0 80.3 86.1 80.1

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/Wait 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-perfspeed Mon May 16 23:07:36 2016

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Dell Inc.

PowerEdge R930 (Intel Xeon E7-8880 v4, 2.20 GHz)

 SPECint2006 = 68.1
 SPECint_base2006 = 65.9

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

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

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 E7-8880 v4 @ 2.20GHz
  4 "physical id"s (chips)
  176 "processors"
core, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 22
siblings : 44
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
cache size : 56320 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"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp1"

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

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SPEC CINT2006 Result

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Platform Notes (Continued)

run-level 3 May 16 23:04

SPEC is set to: /root/ic16.0_Sept12_2015
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   368G  8.9G  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,scatter"
OMP_NUM_THREADS = "88"

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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Dell Inc.

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SPECint2006 = 68.1
SPECint_base2006 = 65.9

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
-std=c++11

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
Dell Inc.  
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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) -opt-ra-region-strategy=block -ansi-alias -Wl,-z,muldefs -L/sh -lsmartheap

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

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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