# SPEC® CINT2006 Result

**Dell Inc.**

PowerEdge R530 (Intel Xeon E5-2683 v4, 2.10 GHz)

<table>
<thead>
<tr>
<th>SPECint_rank2006</th>
<th>1350</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>1300</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test date:** Jun-2016

**Hardware Availability:** Jun-2016

**Software Availability:** Dec-2015

## Hardware

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Specint_rate2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon E5-2683 v4</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.00 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2100</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>32 cores, 2 chips, 16 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 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>40 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 250 GB 7200 RPM SATA HDD</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>None</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Software</th>
<th>Specint_rate2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
<td>SUSE Linux Enterprise Server 12 SP1 3.12.49-11-default</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>File System:</td>
<td>ext4</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>32-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software:</td>
<td>Microquill SmartHeap V10.2</td>
</tr>
</tbody>
</table>

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**Note:** SPEC® (Standard Performance Evaluation Corporation) is a registered trademark of Standard Performance Evaluation Corporation.
Dell Inc.  

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**SPEC CINT2006 Result**  

**SPECint_rate2006 = 1350**  

**SPECint_rate_base2006 = 1300**  

---  

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>64</td>
<td>636</td>
<td>983</td>
<td>635</td>
<td>984</td>
<td>638</td>
<td>980</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>64</td>
<td>963</td>
<td>642</td>
<td>962</td>
<td>642</td>
<td>963</td>
<td>642</td>
</tr>
<tr>
<td>403.gcc</td>
<td>64</td>
<td>530</td>
<td>971</td>
<td>530</td>
<td>972</td>
<td>529</td>
<td>973</td>
</tr>
<tr>
<td>429.mcf</td>
<td>64</td>
<td>337</td>
<td>1730</td>
<td>339</td>
<td>1720</td>
<td>339</td>
<td>1720</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>64</td>
<td>776</td>
<td>865</td>
<td>777</td>
<td>864</td>
<td>777</td>
<td>864</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>64</td>
<td>324</td>
<td>1850</td>
<td>325</td>
<td>1840</td>
<td>323</td>
<td>1850</td>
</tr>
<tr>
<td>458.sfeng</td>
<td>64</td>
<td>841</td>
<td>921</td>
<td>841</td>
<td>921</td>
<td>841</td>
<td>921</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>64</td>
<td>99.2</td>
<td>13400</td>
<td>99.3</td>
<td>13400</td>
<td>99.2</td>
<td>13400</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>64</td>
<td>912</td>
<td>1550</td>
<td>928</td>
<td>1530</td>
<td>894</td>
<td>1580</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>64</td>
<td>614</td>
<td>652</td>
<td>613</td>
<td>652</td>
<td>614</td>
<td>652</td>
</tr>
<tr>
<td>473.astar</td>
<td>64</td>
<td>613</td>
<td>732</td>
<td>613</td>
<td>733</td>
<td>615</td>
<td>730</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>64</td>
<td>302</td>
<td>1460</td>
<td>304</td>
<td>1450</td>
<td>302</td>
<td>1460</td>
</tr>
</tbody>
</table>

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

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### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

---  

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

---  

### Platform Notes

- BIOS settings:  
  - Snoop Mode set to Cluster on Die  
  - Virtualization Technology disabled  
  - System Profile set to custom  
  - CPU Power Management set to Hardware P States  
  - C States set to Autonomous  
  - C1E disabled  
  - Energy Efficient Turbo disabled  
  - Uncore Frequency set to Dynamic  
  - Energy Efficiency Policy set to Balanced Performance  
  - Memory Patrol Scrub disabled  
Symsino program /root/cpu2006-1.2/config/sysinfo.rev6914  
$Rev: 6914$ $Date:: 2014-06-25 $$ e3fbb8667b5a285932ceab81e28219e1  
running on linux-g0aw Mon Jun 20 14:29:40 2016

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:  
Continued on next page
Dell Inc.

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Tested by: Dell Inc.

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

Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo

model name : Intel(R) Xeon(R) CPU E5-2683 v4 @ 2.10GHz
2 "physical id"s (chips)
64 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
cache size : 20480 KB

From /proc/meminfo

MemTotal: 264567584 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:

Linux linux-g0aw 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 20 14:26

SPEC is set to: /root/cpu2006-1.2
Filesystem  Type  Size  Used  Avail  Use% Mounted on
/dev/sda2  ext4  221G  8.7G  212G  4% /
Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program
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Dell Inc.  
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**SPECint_rate2006 = 1350**  
**SPECint_rate_base2006 = 1300**

**CPU2006 license:** 55  
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**Platform Notes (Continued)**

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 04/11/2016  
Memory:  
8x 00CE0B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz  
4x Not Specified Not Specified

(End of data from sysinfo program)

---

**General Notes**

Environment variables set by runspec before the start of the run:  
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB memory using RedHat EL 7.2 glibc 2.17  
Transparent Huge Pages enabled with:  
exto always > /sys/kernel/mm/transparent_hugepage/enabled  
Filesystem page cache cleared with:  
exto 1> /proc/sys/vm/drop_caches  
runcspec command invoked through numactl i.e.:  
umactl --interleave=all runspec <etc>

---

**Base Compiler Invocation**

C benchmarks:  
`icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

C++ benchmarks:  
`icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

---

**Base Portability Flags**

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32  
401.bzip2: -D_FILE_OFFSET_BITS=64  
403.gcc: -D_FILE_OFFSET_BITS=64  
429.mcf: -D_FILE_OFFSET_BITS=64  
445.gobmk: -D_FILE_OFFSET_BITS=64  
456.hmmer: -D_FILE_OFFSET_BITS=64  
458.sjeng: -D_FILE_OFFSET_BITS=64  
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
464.h264ref: -D_FILE_OFFSET_BITS=64  
471.omnetpp: -D_FILE_OFFSET_BITS=64  
473.astar: -D_FILE_OFFSET_BITS=64

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**Base Portability Flags (Continued)**

483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX

**Base Optimization Flags**

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap

**Base Other Flags**

C benchmarks:
403.gcc: -Dalloca=_alloca

**Peak Compiler Invocation**

C benchmarks (except as noted below):
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

400.perlbench: icc -m64
401.bzip2: icc -m64
456.hmmer: icc -m64
458.sjeng: icc -m64

C++ benchmarks:
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

**Peak Portability Flags**

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
403.gcc: -D_FILE_OFFSET_BITS=64
429.mcf: -D_FILE_OFFSET_BITS=64
445.gobmk: -D_FILE_OFFSET_BITS=64

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**Peak Portability Flags (Continued)**

- 456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
  -DSPEC_CPU_LINUX
- 458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
- 462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
- 464.h264ref: -D_FILE_OFFSET_BITS=64
- 471.omnetpp: -D_FILE_OFFSET_BITS=64
- 473.astar: -D_FILE_OFFSET_BITS=64
- 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) -auto-ilp32
- 401.bzip2: -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
  -auto-ilp32 -ansi-alias
- 403.gcc: basepeak = yes
- 429.mcf: basepeak = yes
- 445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
  -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias
  -opt-mem-layout-trans=3
- 456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
- 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
  -auto-ilp32
- 462.libquantum: basepeak = yes
- 464.h264ref: -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) -unroll12
  -ansi-alias

**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) -ansi-alias
  -opt-ra-region-strategy=block -Wl,-z,muldefs

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## Peak Optimization Flags (Continued)

471.omnetpp (continued):
- L/sh -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

## 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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